#### **KU LEUVEN**

Functional classification and material characterization of plastic packaging in Flemish land litter to support effective reduction policies



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## **Problem statement**

- Littering, in particular of plastics, is a nuisance
- Ocean plastics largely originate from land-based sources, including littering

Need for effective measures to reduce land littering of plastics

• Little to no systematic information available on the functional and material composition of <u>land</u> litter



## **Research objectives**

 Functional classification + Material characterization of plastic packaging in land litter



## Applied methodology

- Land litter sampling (OVAM), 2019 2021, covering all seasons
  - Public domain in Flanders divided in 10m\*10m grid squares
    - Classified based on littering incidence and nuisance level
  - Selection of squares for statistical representative sampling
  - In selected squares: all litter collected



## Applied methodology

#### 8 fractions containing plastics

#### Beverage cups and lids

Other food packaging

Single-use rigid plastic food packaging

Single-use plastic food packaging film

Packaging films - Non-food

Other plastic packaging - Non-food

Plastic bottles up to 3 l

Plastic bags



Removal of nonplastic packaging

#### Plastic beverage cups and lids

Other plastic food packaging



## **Functional classification**

8 fractions containing plastics

Plastic beverage cups and lids

Other **plastic** food packaging

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Single-use plastic food packaging film

Packaging films - Non-food

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Plastic bottles up to 3 l

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#### Beverage packaging

Food packaging

Non-food packaging

## **Functional classification**

#### Beverage packaging

Bottles



Bottle caps



Cups and lids

Beverage pouches

#### 



#### Food packaging





Films



# Non-food packagingRigidFilmsBagsImage: Second secon

## Materials characterization

Each classified item scanned with handheld NIR scanner

- PP, PET, PE, PS, PA, PLA, PVC and 'other' (identified polymers)
- Unidentified plastics (e.g., laminates)
- Plastic films with an aluminum barrier
- Black plastics
- XPS



## Materials characterization

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#### **Each material fraction**

- Weighed
- Number of items determined



## **Results functional classification**



### **Results material characterization**



■ PP ■ PET ■ PE ■ PS ■ XPS ■ PA ■ PLA ■ PVC ■ Other ■ Unidentified ■ Aluminum barrier ■ Black

## Conclusions

- Deposit return system for PET bottles packaging litter
  - Reduction only 5% of total land litte
- · Packaging films: high 'likeliness-to-get-
  - Restrict use



- Mentality change: both wrt littering and packaging use
- Plastic packaging in collected litter: 3 mass% of plastic packaging selectively collected at the source
- 'Snapshot' of litter composition in public domain in Flanders → not necessarily representative for other regions

# Thank you!

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