Rheinland-Pfälzische
Technische Universität
Kaiserslautern
Landau

AgriRePlas



First Results of the Survey: Plastics in Agricultural Practice

Zacharias Steinmetz

Plastics in Agricultural Practice















Plastics in Agricultural Practice

What/how much is *actually* used?



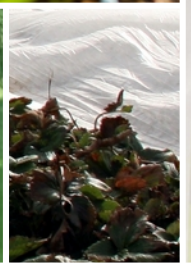
















Where do they go?

Objectives

- Assessing the “status quo” of plastic (re)use and recycling in agriculture to inform
  - Geographic research
  - Plastic footprint estimations

- Potential reasons for (not) using plastics or reuse/recycling systems to identify alternatives

Methods

- LimeSurvey hosted by RPTU
- In English, French, and German
- Active from 10/2025–8/2026
- Advertisement through AgriRePlas partners
- Face-to-face interviews on local fairs and conferences



Plastics in Agricultural Practice

Dear participants,

In the Interreg project, AgriRePlas, we are seeking solutions to minimize the plastic footprint in agriculture along the Upper Rhine. We are collaborating with practitioners, manufacturers, associations, and scientists from northern Switzerland, Alsace, Baden, and the Palatinate.

AgriRePlas

Through this survey, we hope to learn from your practical experience with agricultural plastics. We have divided the survey into four sections, which we will now review together:

- Use of agricultural plastics and plastic packaging
- Reusable systems
- Recycling
- Biodegradable plastics

The results will help us better understand the situation in the region. Based on

AI-assisted classification

- Many free text fields

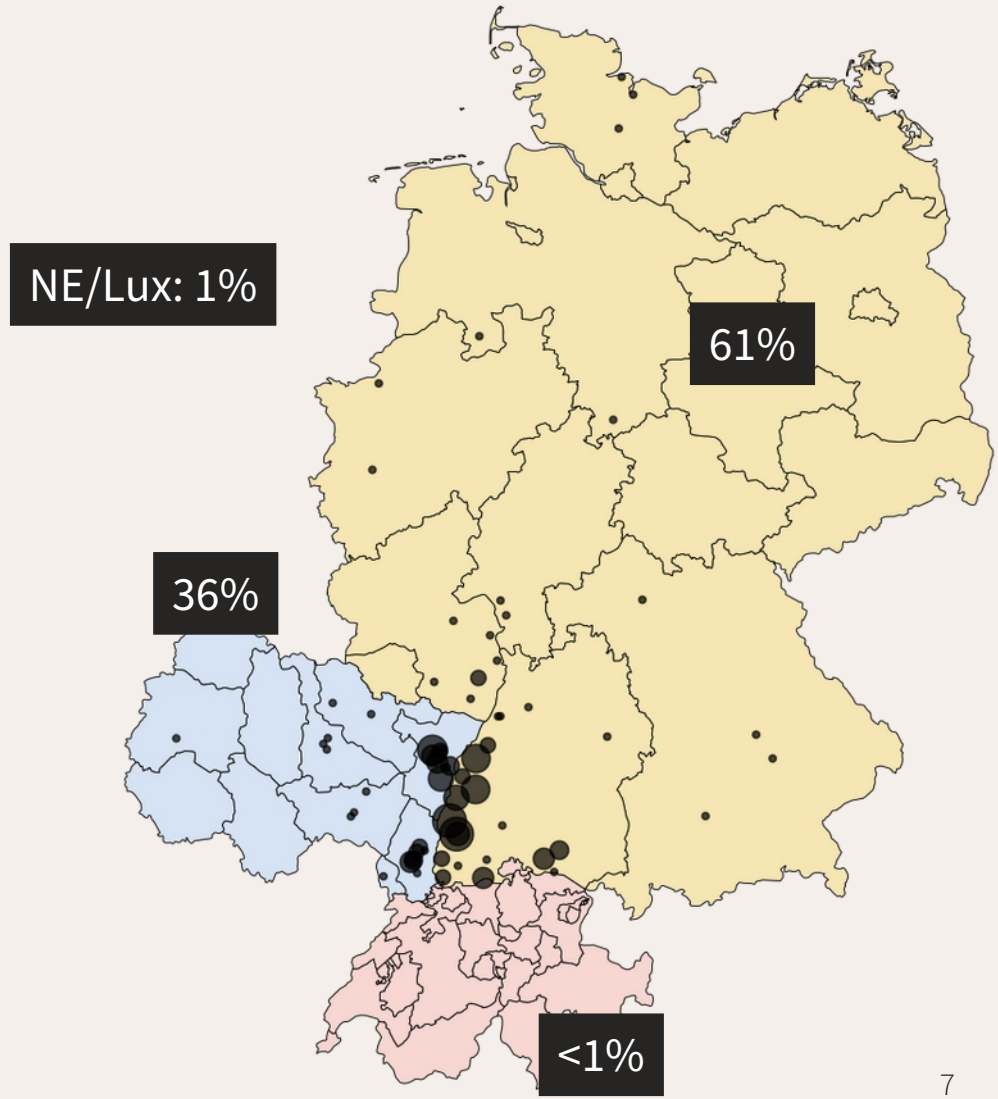
- General approach
  1) AI inferred categories from free texts
  2) Finalization of categories by expert
  3) Automated assignment of predefined categories

- R with Mistral Medium 3.5 128B (`t = 0.1`)

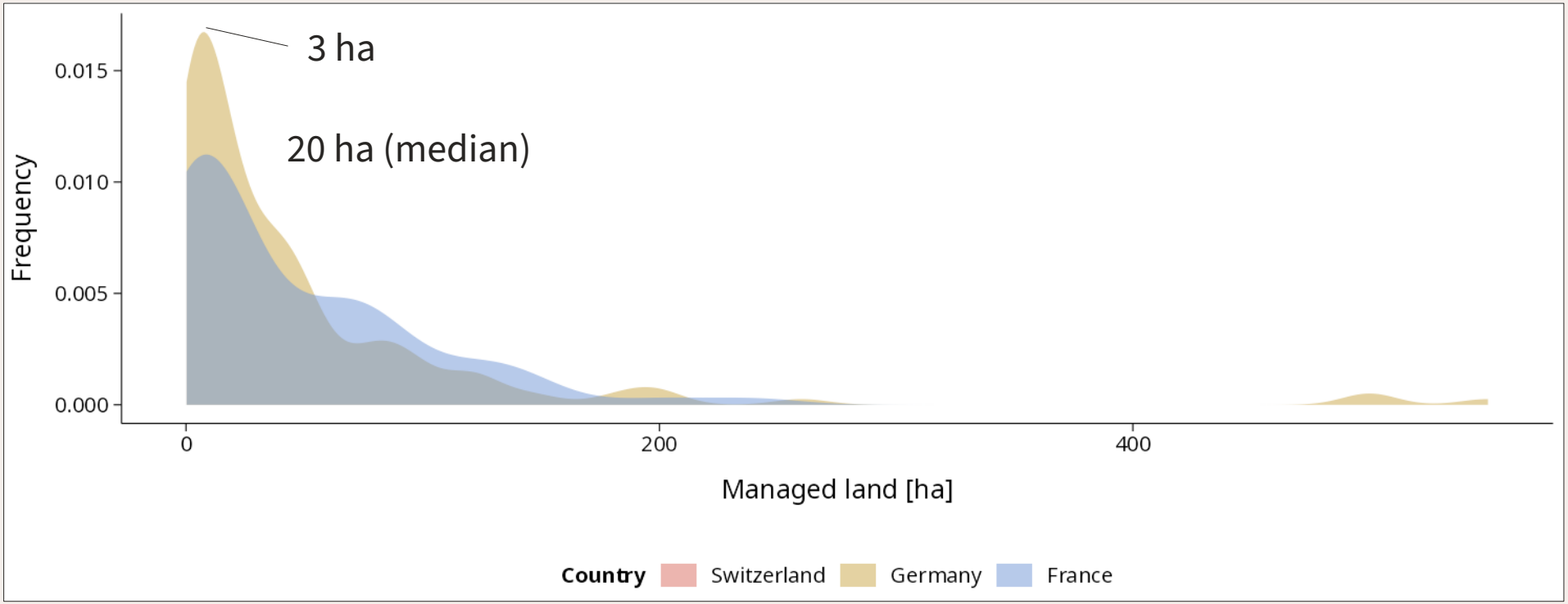
```
224
225   return(result[])
226 }
227
228 start_chat <- function(prompt_file) {
229   system_prompt <- paste(
230     readLines(prompt_file, encoding = "UTF-8"),
231     collapse = "\n"
232   )
233
234   chat_openai_compatible(
235     name = "Academic Cloud",
236     base_url = "https://chat-ai.academiccloud.de/v1",
237     model = "mistral-medium-3.5-128b",
238     system_prompt = system_prompt,
239     params = params(temperature = 0.1, top_p = 0.9)
240   )
241 }
242
```

Responses

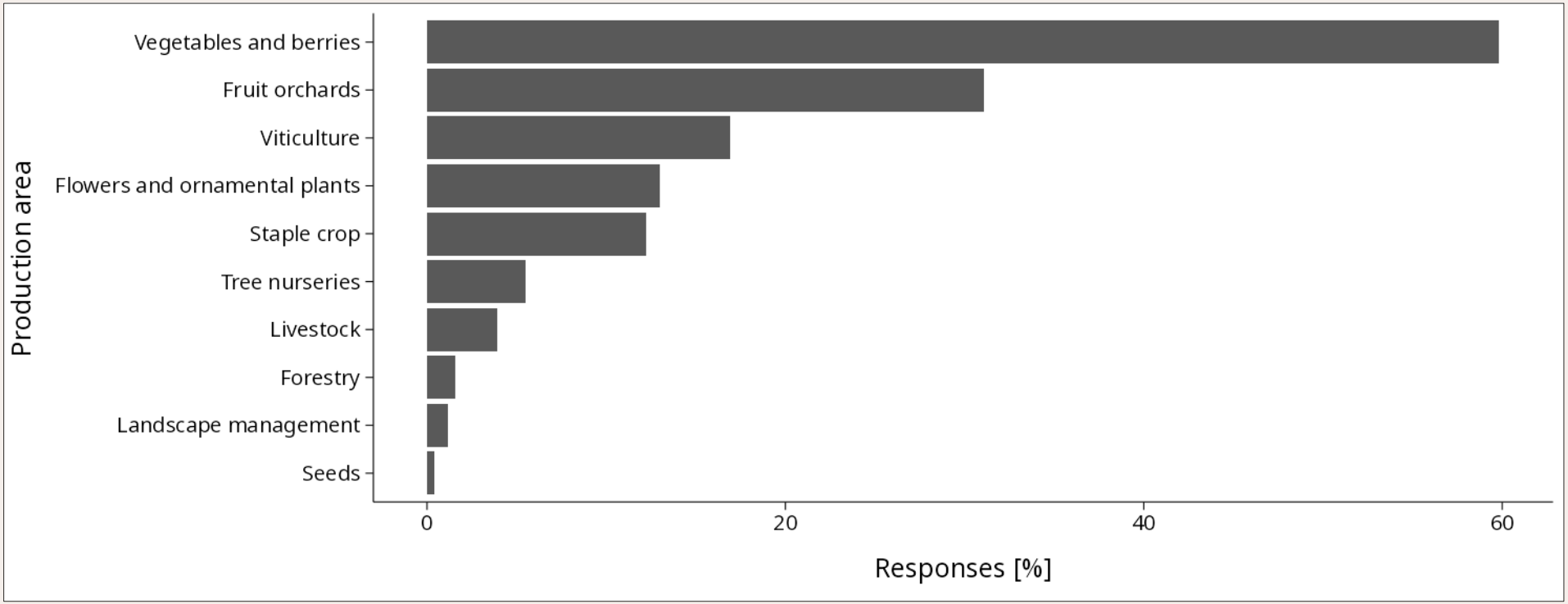
- 489 clicks
- 254 completed questionnaires from 5 countries



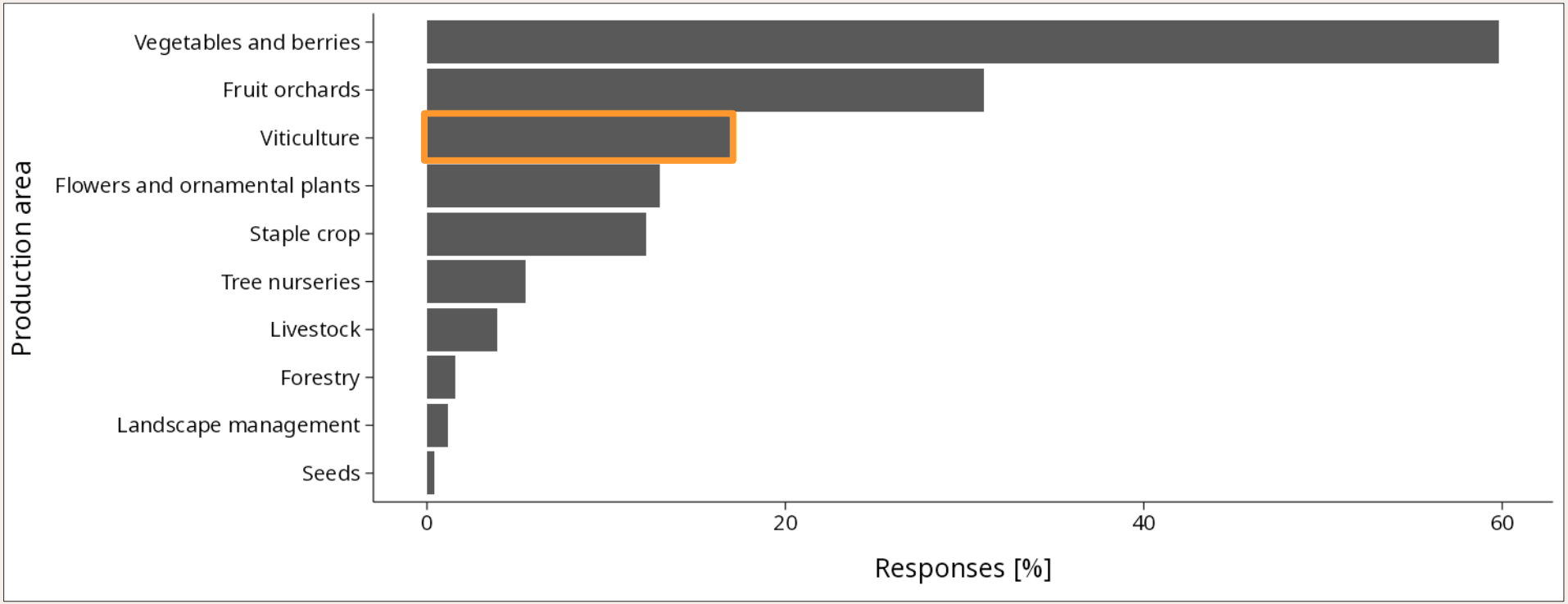
Managed land

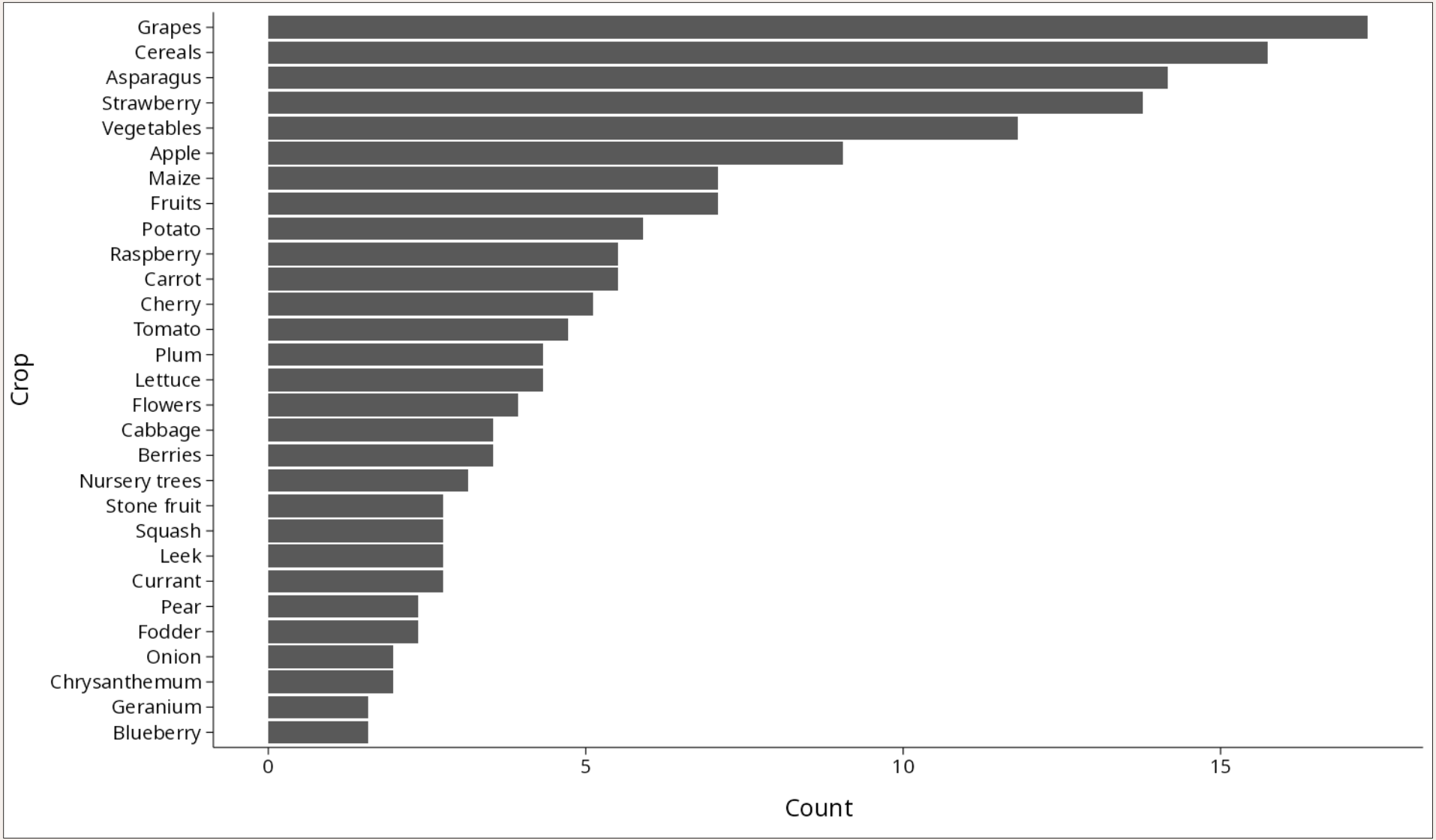


Production area and crops

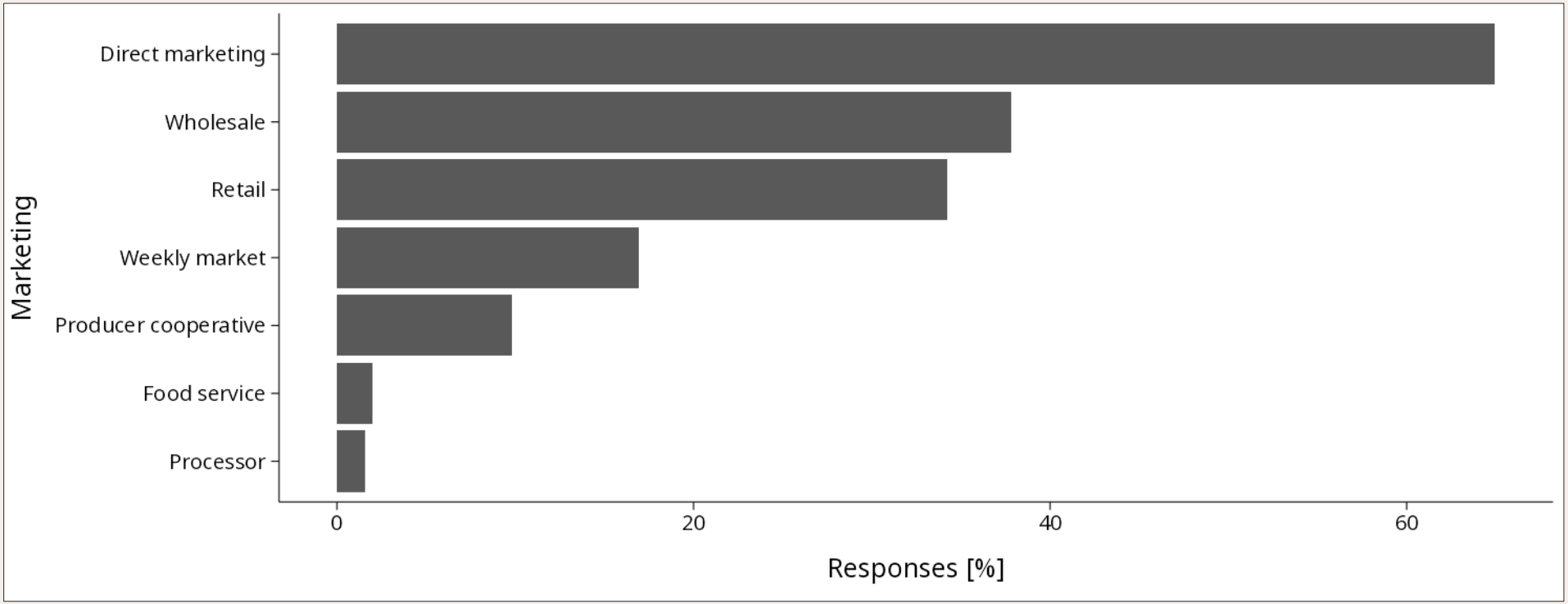


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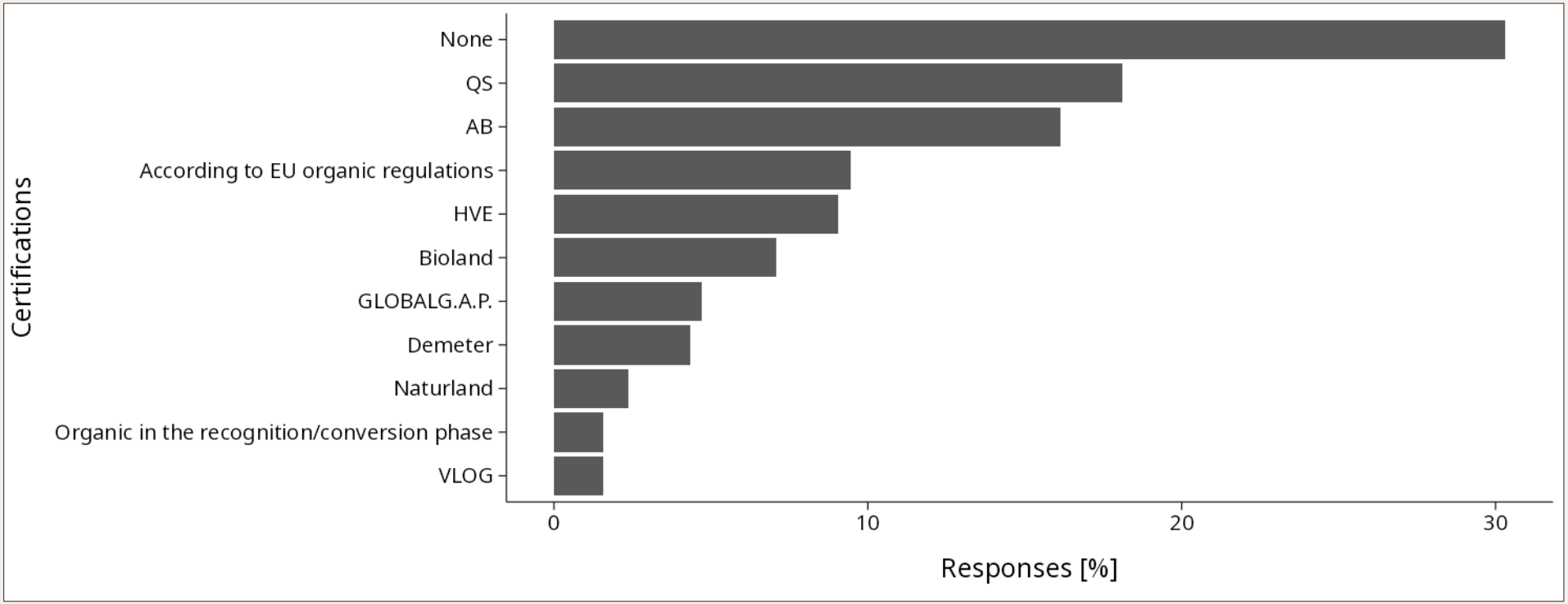



Grapes
Cereals
Asparagus
Strawberry
Vegetables
Apple
Maize
Fruits
Potato
Raspberry
Carrot
Cherry
Tomato
Plum
Lettuce
Flowers
Cabbage
Berries
Nursery trees
Stone fruit
Squash
Leek
Currant
Pear
Fodder
Onion
Chrysanthemum
Geranium
Blueberry
Crop
0
5
10
15
Count

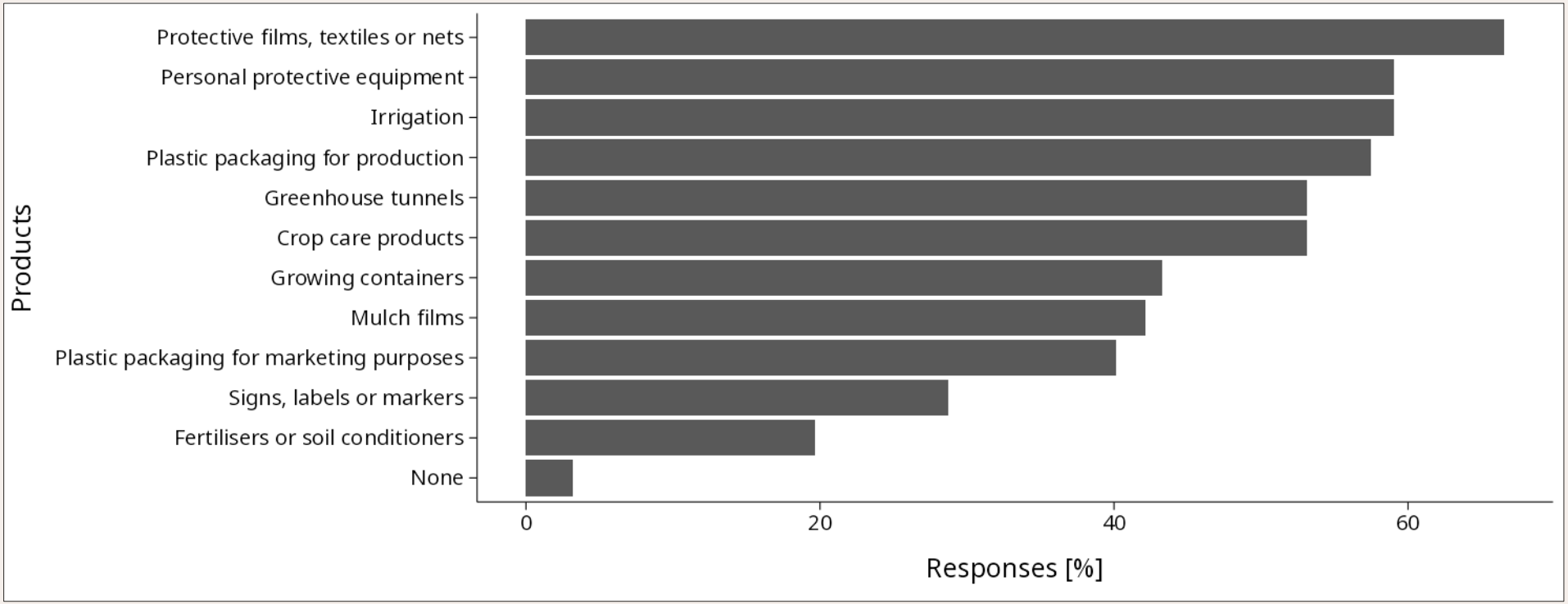
Marketing


Direct marketing
Wholesale
Retail
Weekly market
Producer cooperative
Food service
Processor
Marketing
0
20
40
60
Responses [%]

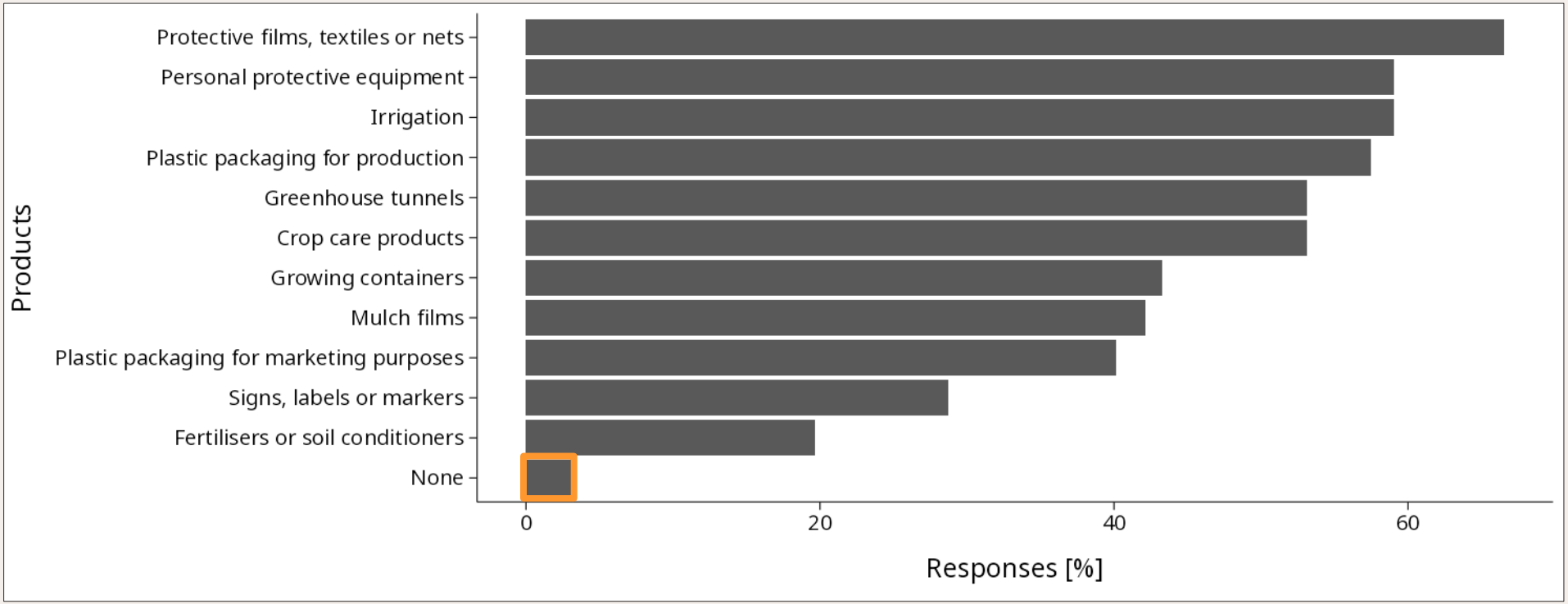
Certifications



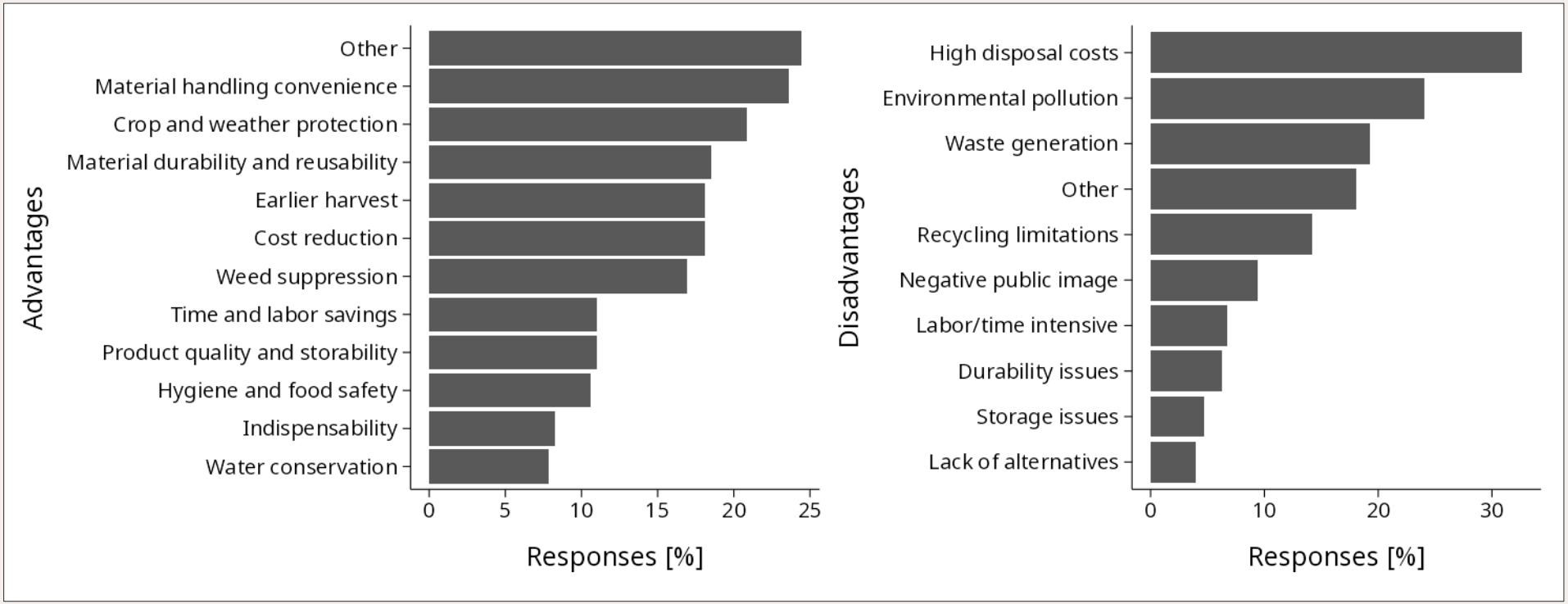
Plastic products



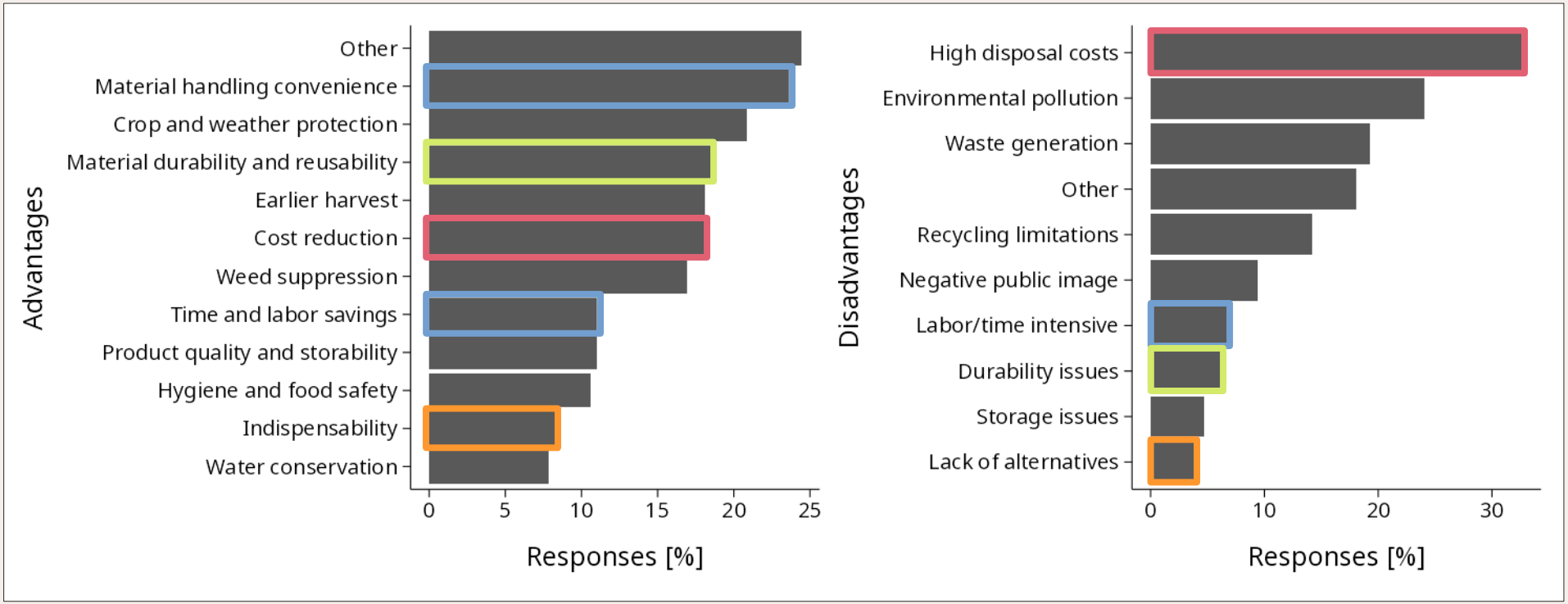
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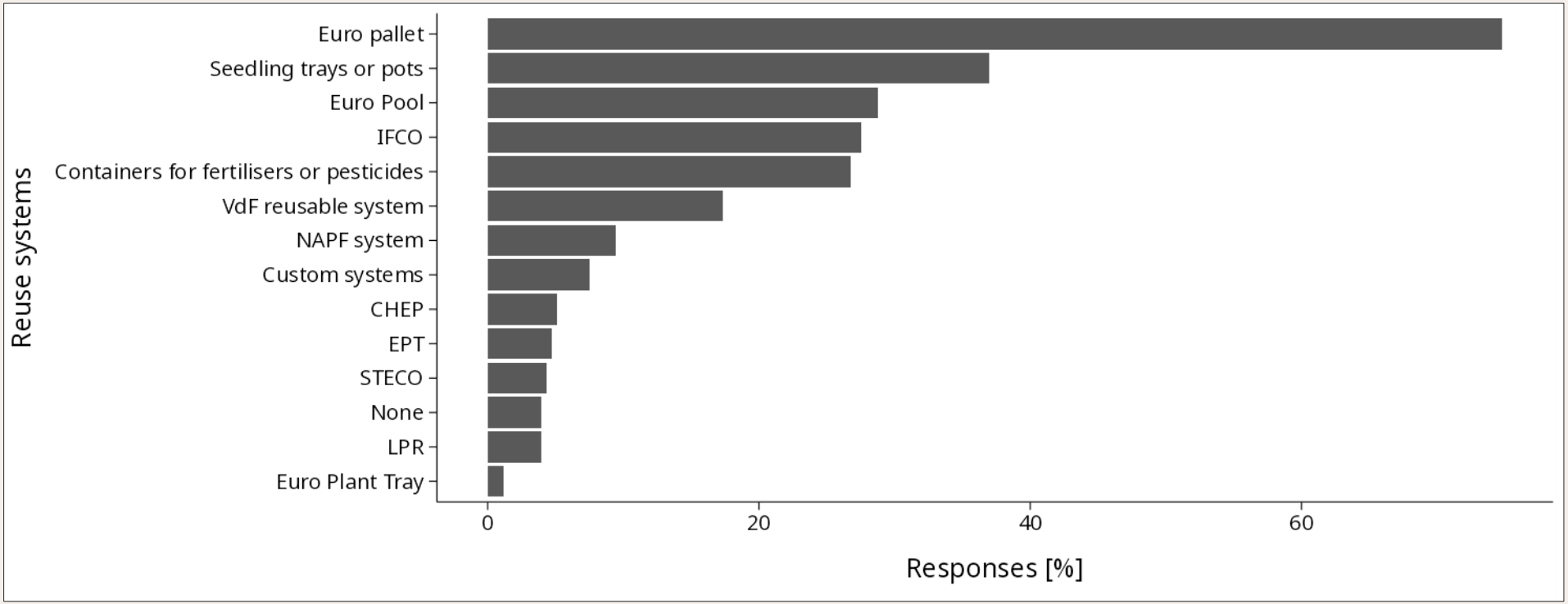
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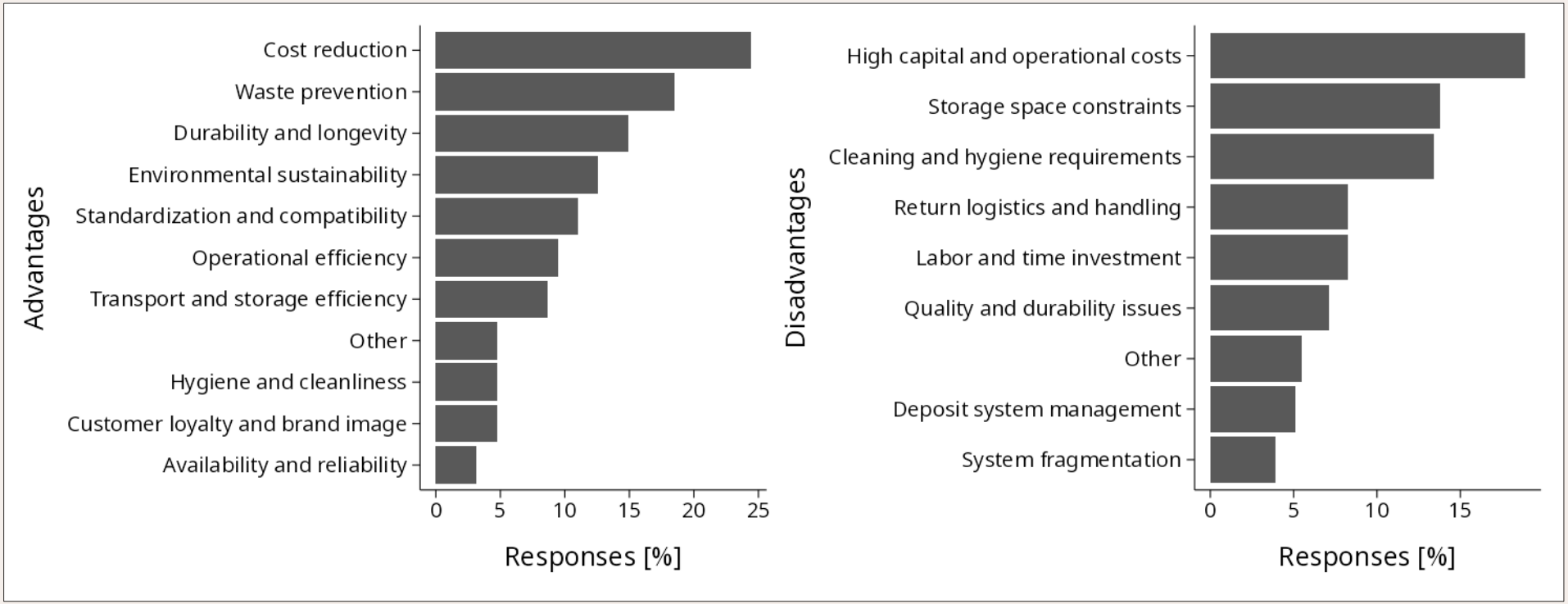
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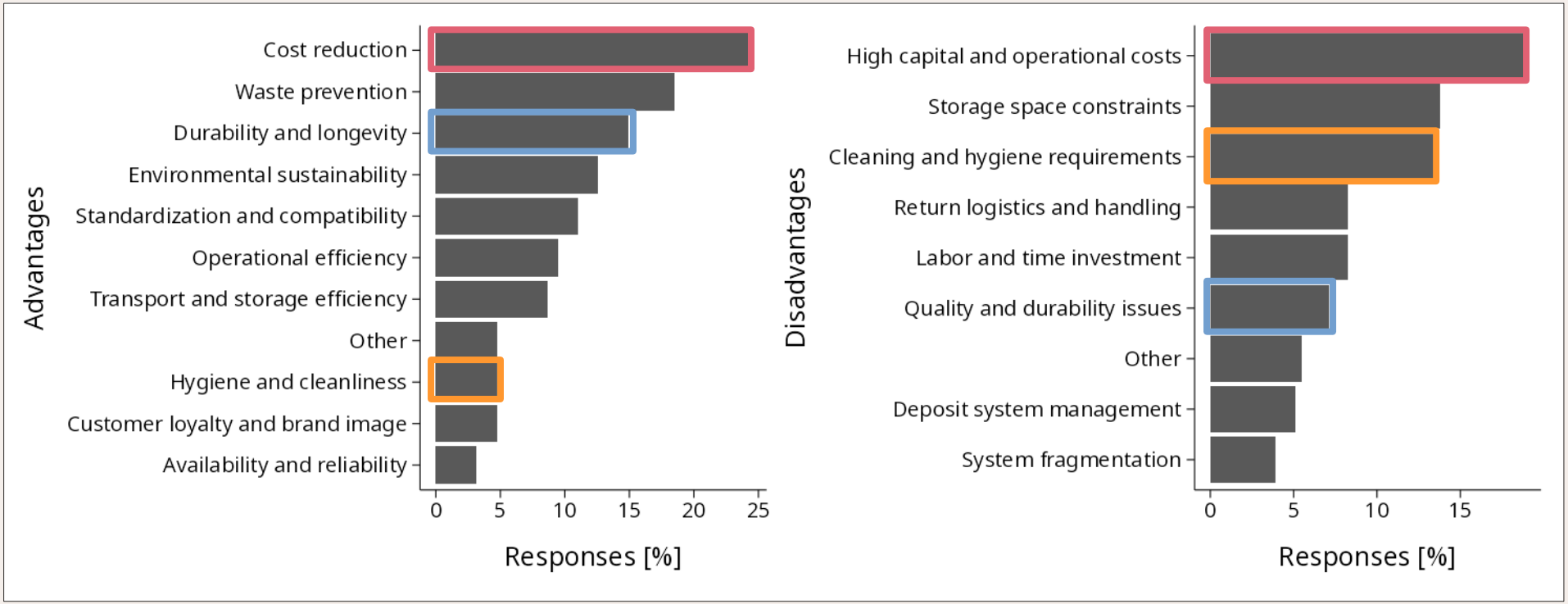
Reuse


Euro pallet
Seedling trays or pots
Euro Pool
IFCO
Containers for fertilisers or pesticides
VdF reusable system
NAPF system
Custom systems
CHEP
EPT
STECO
None
LPR
Euro Plant Tray
Reuse systems
0
20
40
60
Responses [%]

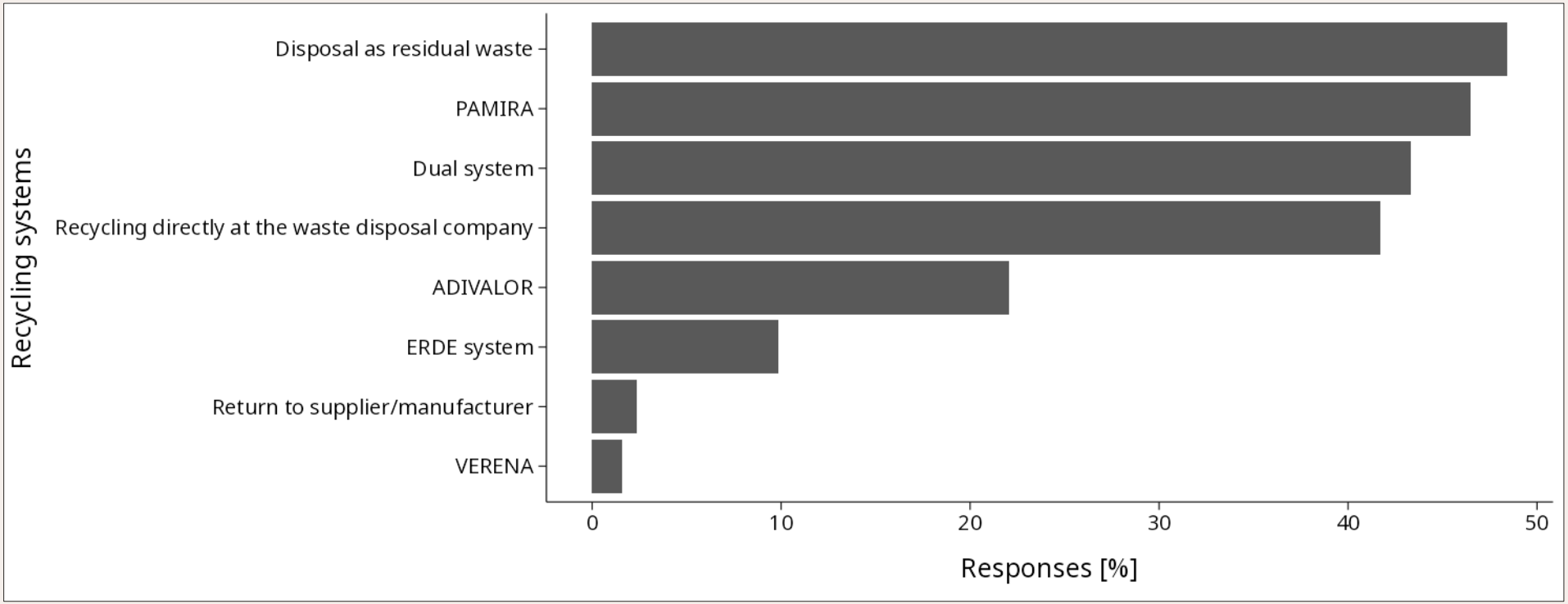
Reuse


Advantages
Cost reduction
Waste prevention
Durability and longevity
Environmental sustainability
Standardization and compatibility
Operational efficiency
Transport and storage efficiency
Other
Hygiene and cleanliness
Customer loyalty and brand image
Availability and reliability
0
5
10
15
20
25
Responses [%]
Disadvantages
High capital and operational costs
Storage space constraints
Cleaning and hygiene requirements
Return logistics and handling
Labor and time investment
Quality and durability issues
Other
Deposit system management
System fragmentation
0
5
10
15
Responses [%]

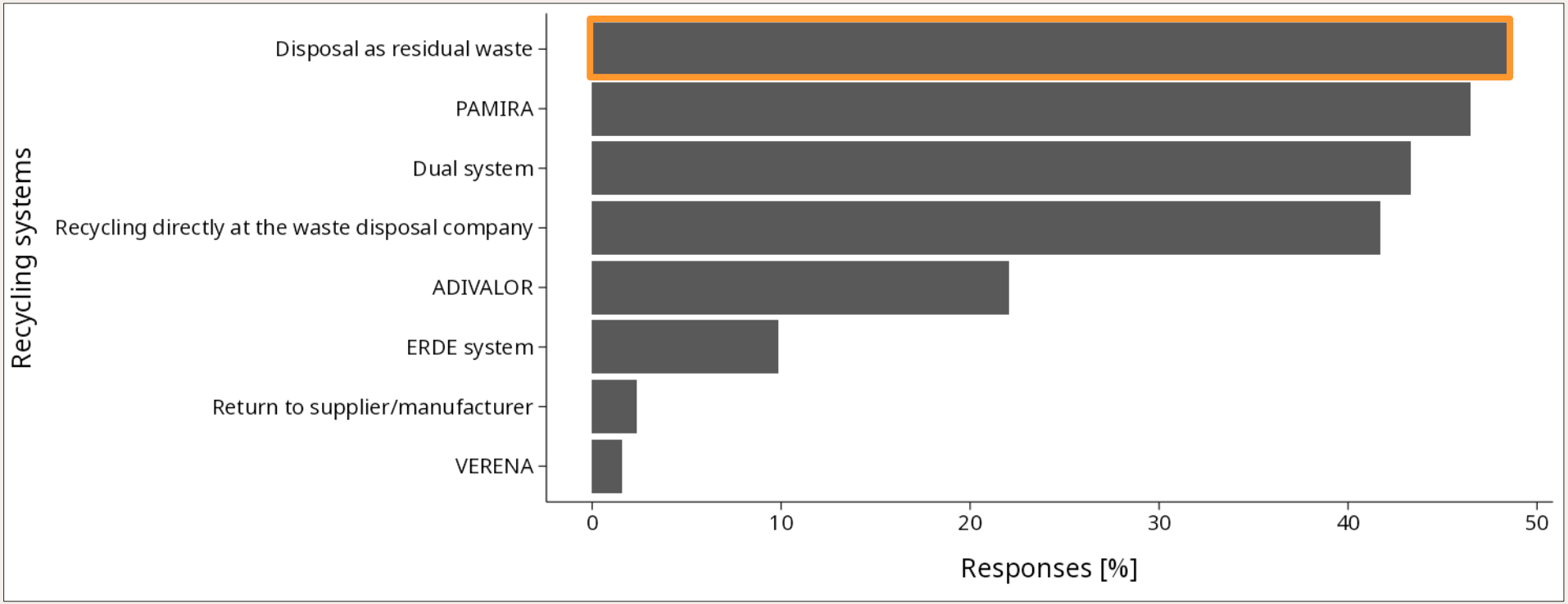
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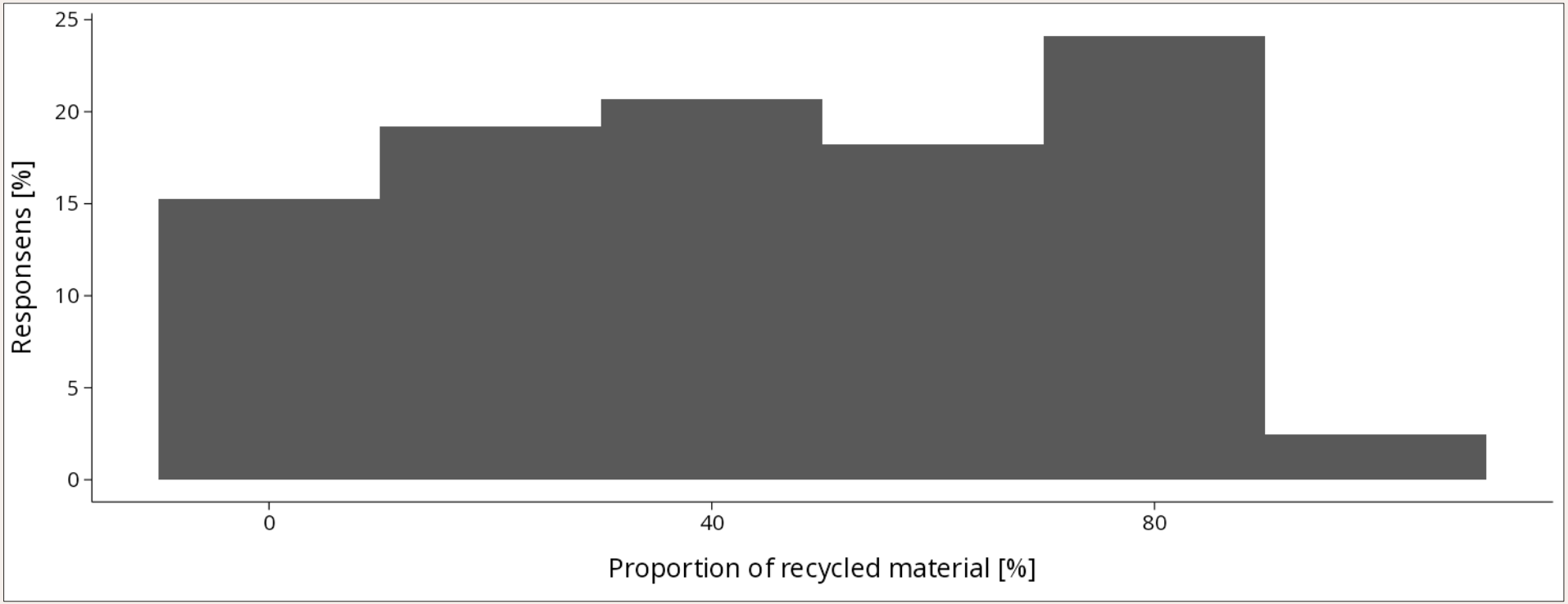
Recycling


Recycling systems
Disposal as residual waste
PAMIRA
Dual system
Recycling directly at the waste disposal company
ADIVALOR
ERDE system
Return to supplier/manufacturer
VERENA
0
10
20
30
40
50
Responses [%]

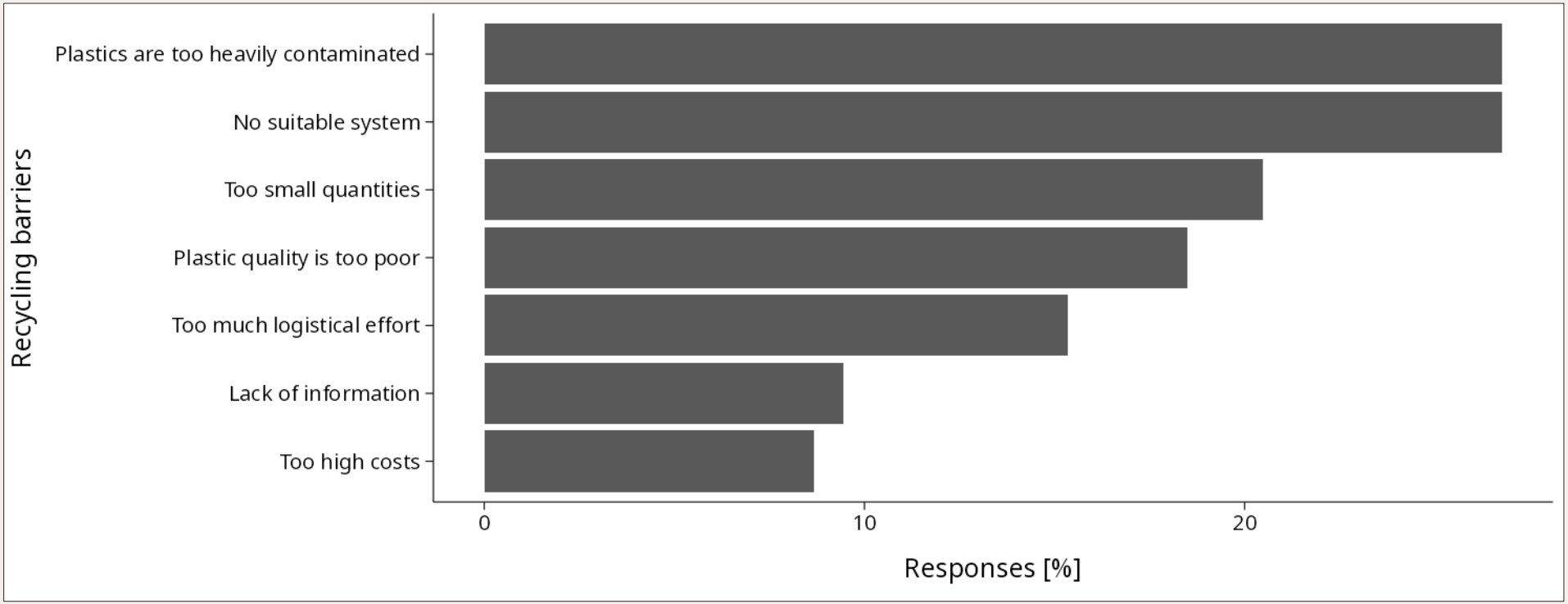
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0
10
20
30
40
50
Responses [%]

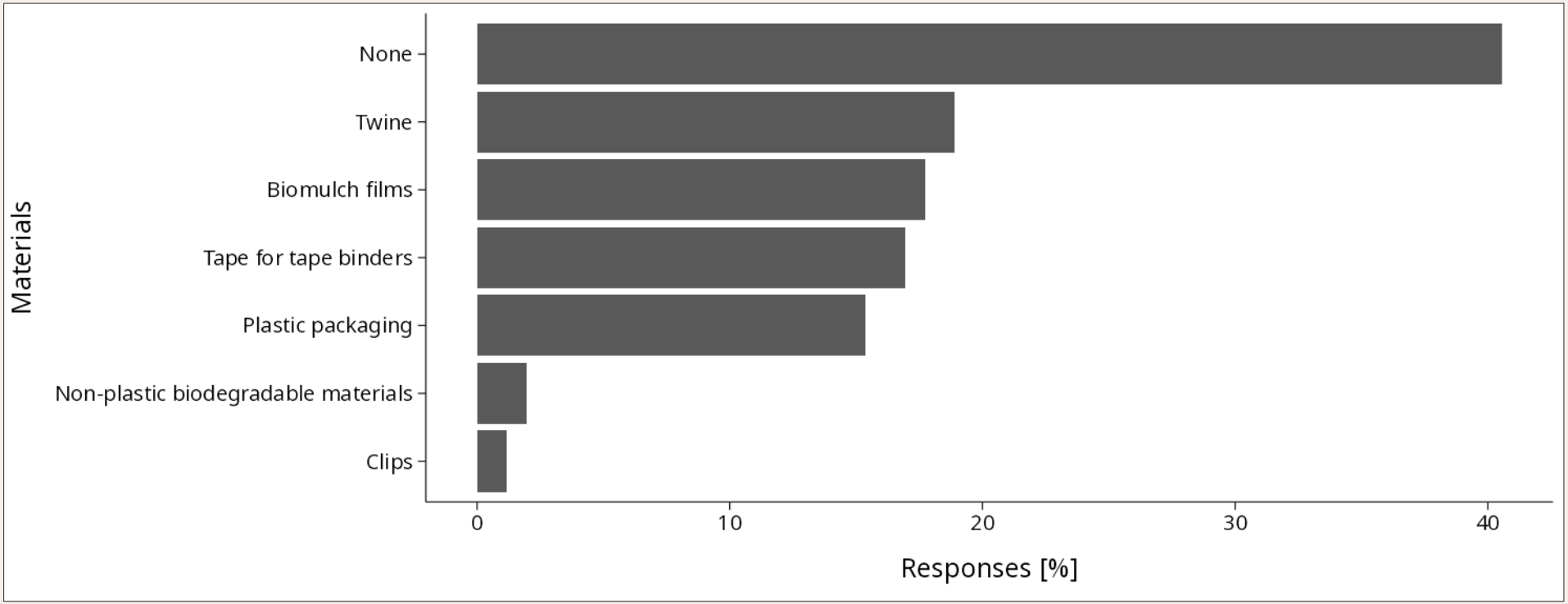
Recycling


25
20
15
10
5
0
Responsens [%]
0
40
80
Proportion of recycled material [%]

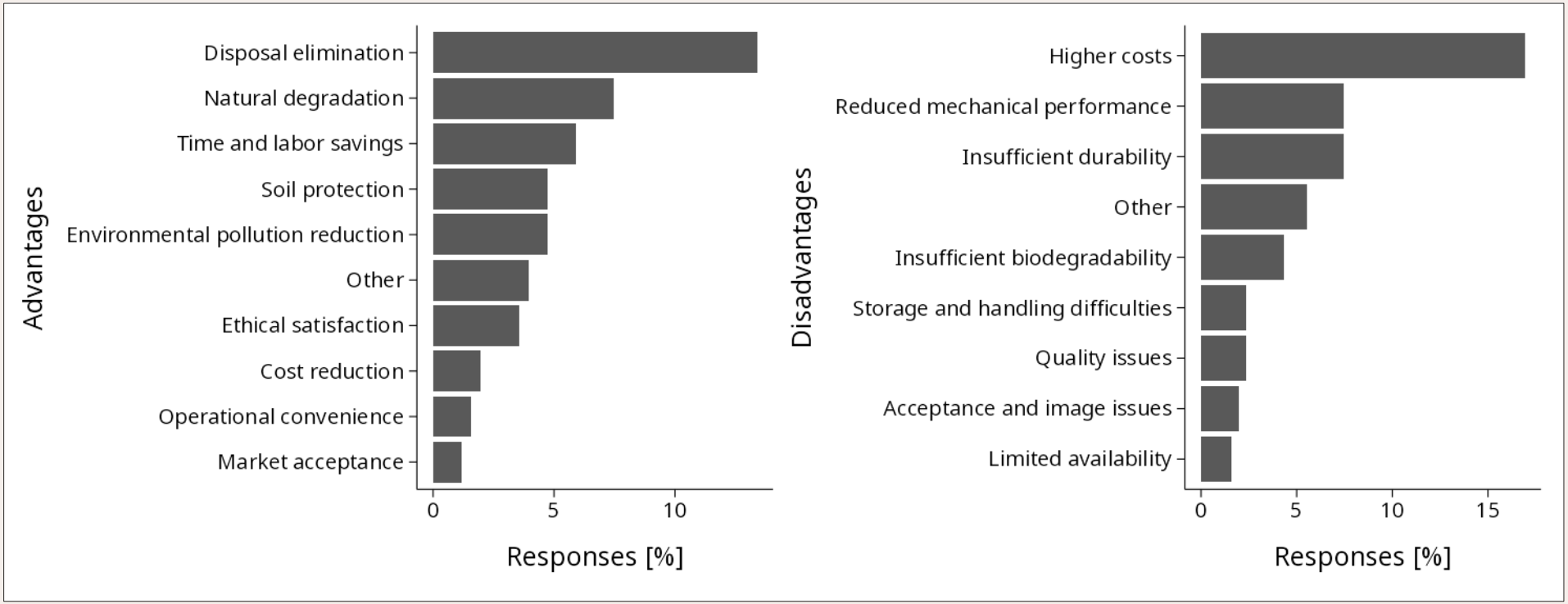
Recycling


Plastics are too heavily contaminated
No suitable system
Too small quantities
Plastic quality is too poor
Too much logistical effort
Lack of information
Too high costs
Recycling barriers
0
10
20
Responses [%]

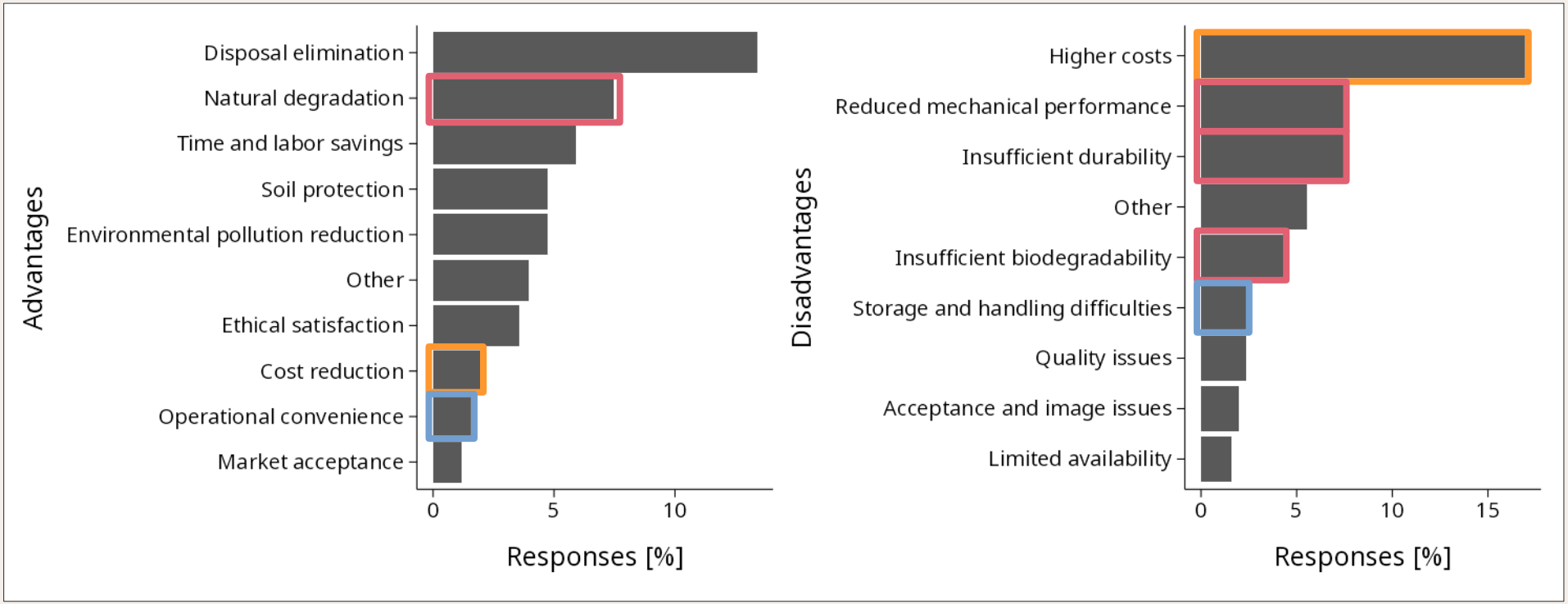
Biodegradable plastics



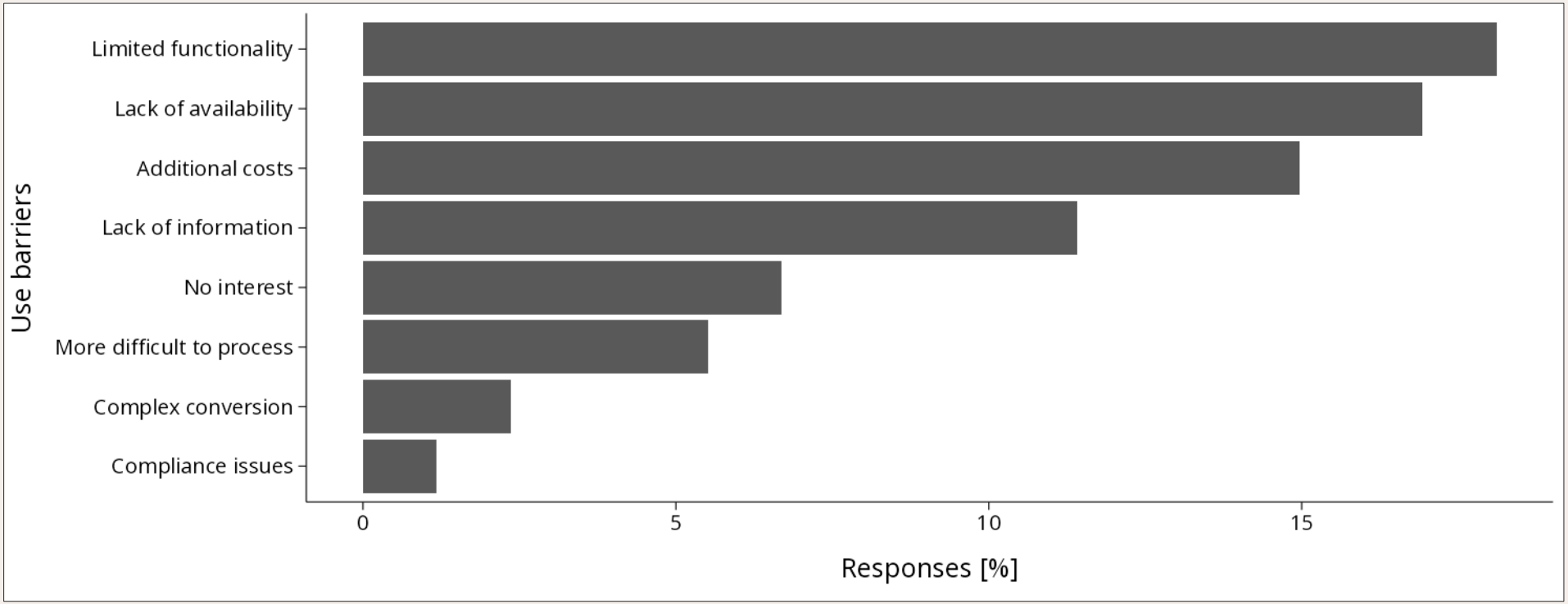
Biodegradable plastics



Biodegradable plastics



Biodegradable plastics



Conclusions

- Plastic use is indispensable; biodegradable plastics are less accepted

- Majority of plastics disposed of as residual waste
- Recycling rates vary greatly (0–80%)

- Perceived advantages and disadvantages inconclusive and probably depend on use case

Next steps

- Cross-validating AI classifications
- Representativity of the data → geographical research

- Preparation of a scientific publication

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Interreg
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