

# Heavy Metal City-Zen



*Exploring the potential risk of heavy metal contamination of food crop plants in urban gardening contexts using a citizen science approach*



University of Natural Resources  
and Life Sciences, Vienna



Der Wissenschaftsfonds.

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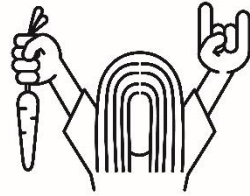
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<https://heavymetalcityzen.com/>

# Background



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- Urban gardening has become increasingly popular in the past two decades.
- Citizens reclaim derelict land by using roof top gardens and novel containers.
- Trace metals are one of the contaminants frequently found in urban crops and soils.
- Urban location leads to worries about food safety.
- Concerns about transfer of urban pollutants into the food chain.
- Concerns often outweigh the true risk.
- Problem: lack of data in urban production context.
- Collection of city-wide data on the health of soil is often difficult and expensive.



# Aims



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- Exploring the potential risk of heavy metal contamination of food crop plants in Vienna.
- Recruit citizens to conduct simple experiments in their urban gardens.
- Create a city map of soil health status.
- Provide information on potential risk of heavy metal contaminants.
- Provide information to mitigate those risks in an Urban Garden context.
- Jointly generate useful information for the greater public good.
- Avoiding knowledge deficit model by engaging citizens in the experimental process.





# Activities



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## Recruitment of citizens

Target group: Community Urban  
Gardeners in Vienna



## Face to face consultations



## “Hub and spoke design”

*Spokes:*

Citizen Science pot experiments

*Hub:*

Heavy metal analysis in the laboratory



## Public outreach & dissemination:

Direct communication

Homepage

Social Media

Podcast

Pub-Quiz

Open Lab Day

Risk assessment map

Final Event

Conferences

Publications

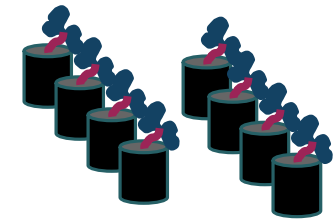
# Methodologies



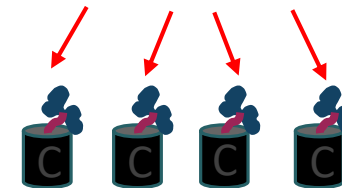
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## 1. Citizen Science pot experiments

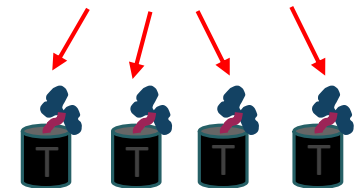
- **Pots** (11x11x12 cm): buried in raised beds
- **Seeds:** Radish (*Raphnus sativus*) or Spinach (*Spinaca oleracea*)
- **Control:** CS collect soils from their neighbourhoods
- **Treatment:** soil amendment such as mixing local soil with local compost
- **Replicates:** 4
- **Experimental duration:** 4-5 weeks
- **Parameters on site:** pH of soil, plant vigour, relative amount of chlorophyll (SPAD Chlorophyll Meter)



Control:  
native soil



Treatment:  
soil amendment



# Methodologies



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## 2. Heavy metal analysis

- We will set out to investigate if heavy metal concentration (Pb, Cd, Zn) in plants differs between native soil and soil amendment.
- Heavy metal analysis of plant and soil samples of the CS pot experiments will be carried out after acid digestion or ammonium nitrate extraction using an AAS or ICP-OES.

