

2021 GLOBE Virtual Meeting for Europe and Euroasia
October, 5. - 7. 2021.

Danger of batteries buried in the ground

Students: Ena Stanić i Nadalina Jerčić, GLOBE group
Elementary school Josip Pupačić Omiš
Mentor: Tamara Banović, prof.

Aim:

Investigate how batteries deposited in the soil affect the composition and properties of the soil and how contamination by discarded batteries affects the germination and growth of the bean plant.

Hypotheses:

- Batteries deposited in the soil will not change its structure and texture.
- Batteries deposited in the soil will reduce the pH of the soil, while other soil properties will not change (soil color, temperature and permeability).
- In a container with discarded batteries, less bean seeds will germinate than in a container without batteries.
- Bean plants growing in a pot with discarded batteries will have lower stem growth compared to bean plants growing without batteries.



Research methods

Research time:

from September to December 2020.

Part 1 of the research: in the school garden

Part 2 of the research: in the school laboratory





Research in the school garden:
the influence of batteries on the structure,
texture and properties of the soil

Soil properties

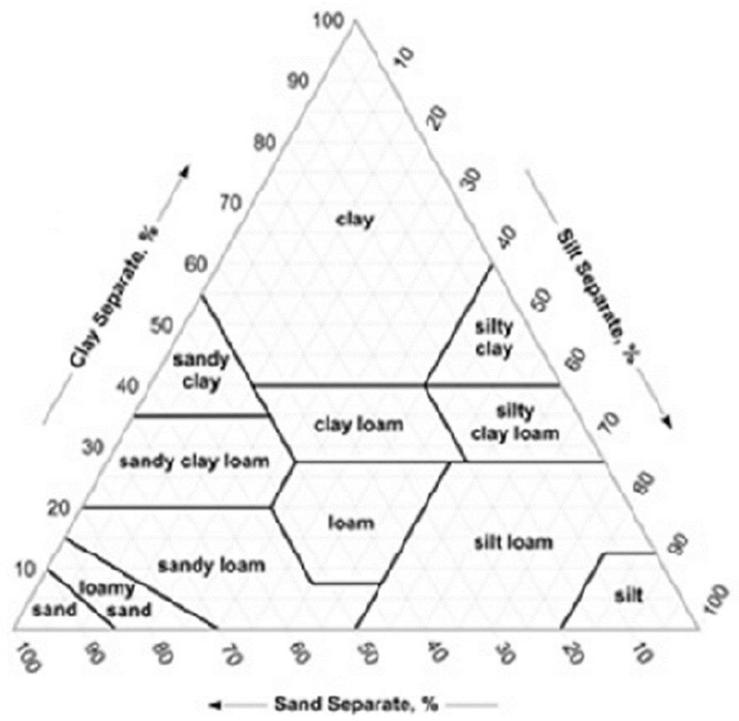
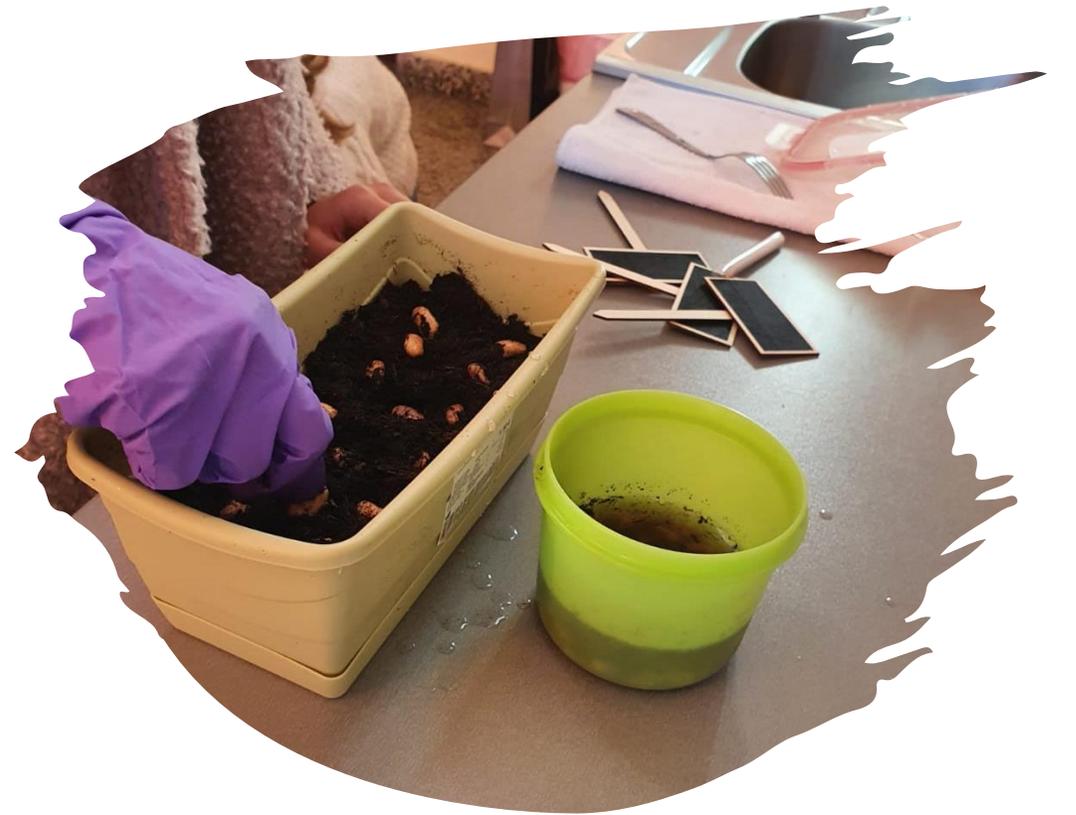


Figure 1 Textuarl triangle (Soil Survey Staff, 1951., prilagodio Alduk, 2017)



Research in the school laboratory: the influence of batteries in the soil on the germination and growth of the bean plant

Results and discussion

Results of measuring the structure, texture and properties of soil in a school garden

First measurement: September 10, 2020

Measurements	Station 1 *	Station 2
Structure	granular	granular
Texture	sandy loam	sandy loam
Color	brown	brown
pH value	7,5	7,5
Temperature (5 cm)	24	25,5
Temperature (10 cm)	22	22
Permeability	53%	52%

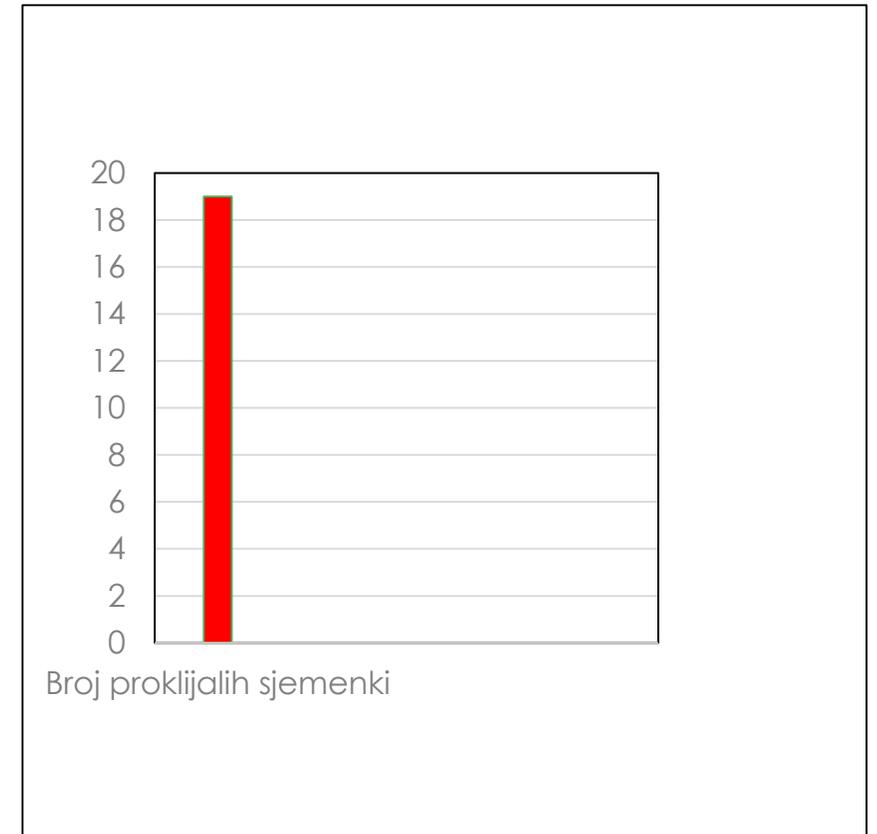
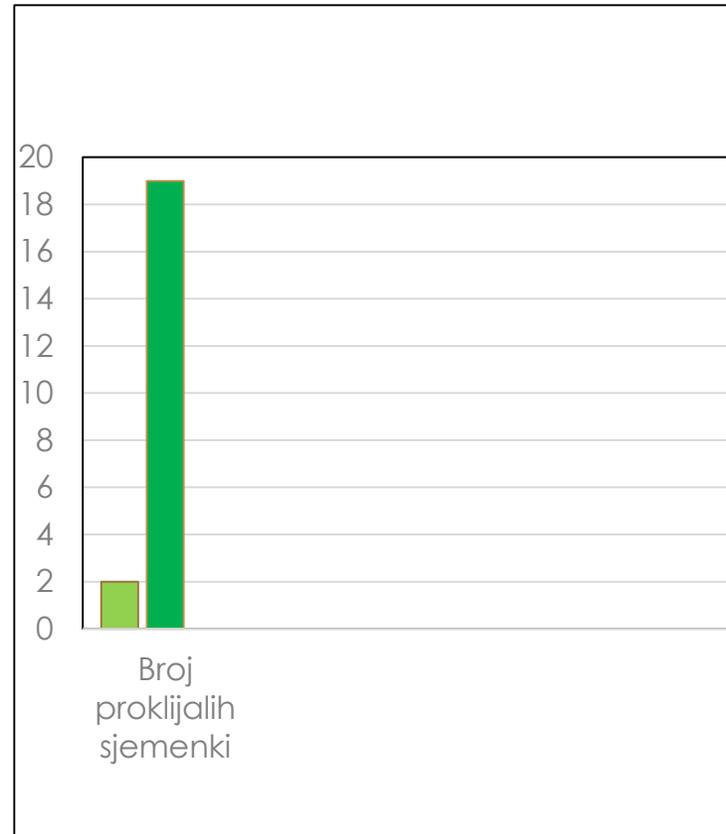
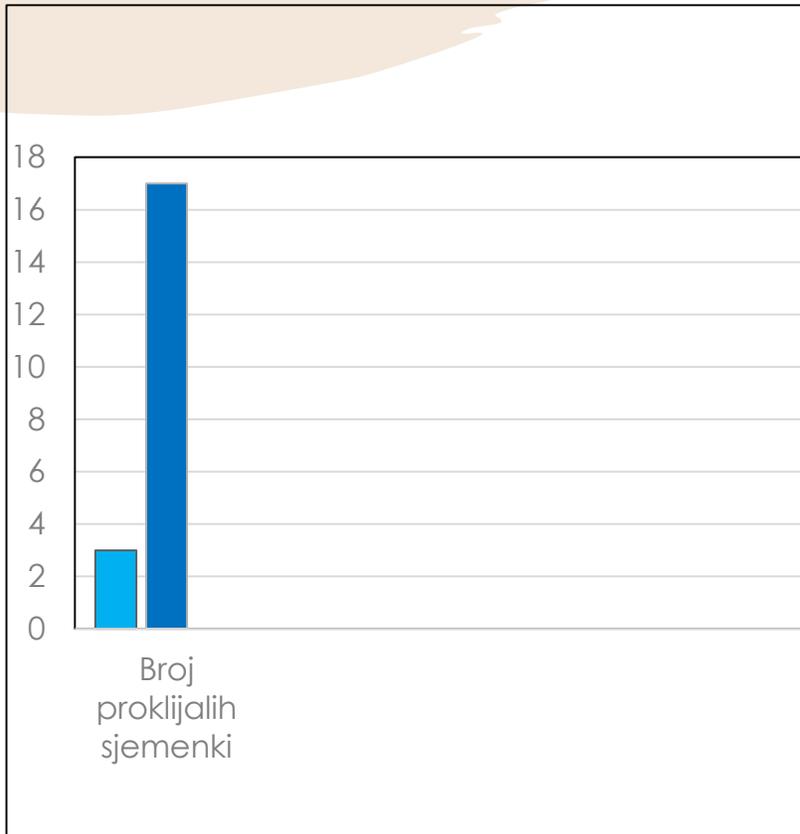
*before disposing of the batteries in ground

Second measurement: November 10, 2020

Measurements	Station 1 **	Station 2
Structure	granular	granular
Texture	sandy loam	sandy loam
Color	brown	brown
pH value	6	7,5
Temperature (5 cm)	21	22
Temperature (10 cm)	18	18
Permeability	52%	52%

**60 days after disposing of the batteries in the ground

Results of the influence of substances from batteries in the soil on the germination of bean seeds

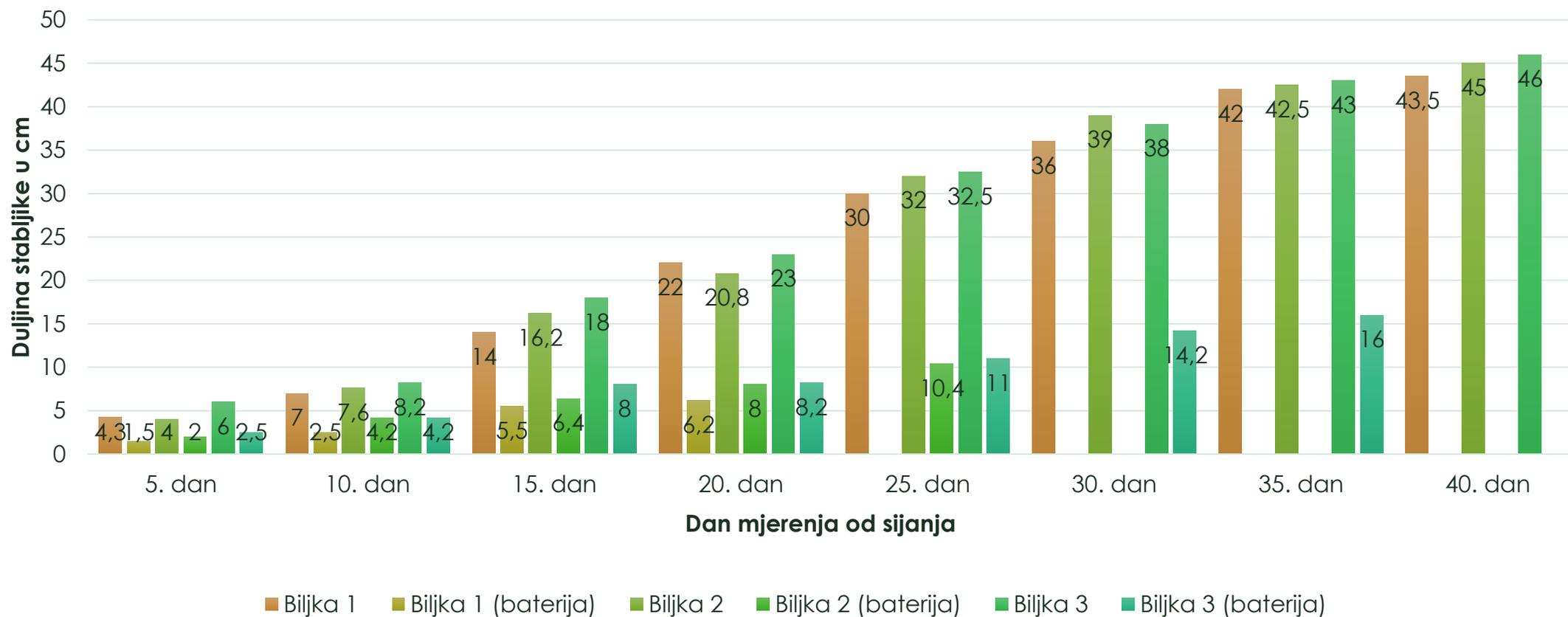




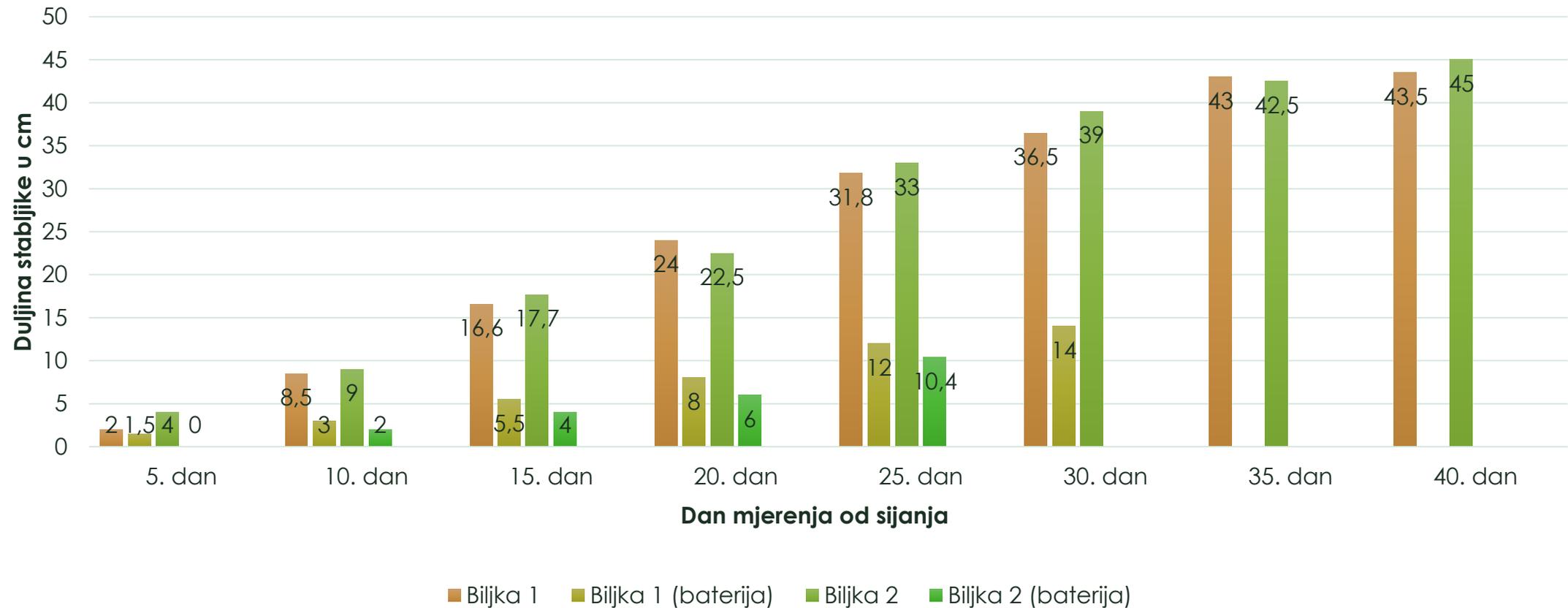
BATERUJE

BATERUJE

Results of the influence of substances from batteries on the growth of the bean plant (First sample)



Results of the influence of substances from batteries on the growth of the bean plant (Second sample)



Conclusions

- ✓ Substances from batteries in the soil do not change the structure and texture of the soil.
- ✓ Substances from batteries in the soil do not affect its color, temperature and water permeability.
- ✓ Substances from batteries deposited in the soil increase its acidity.
- ✓ Bean plants grow in a soil where batteries are deposited will have lower germination compared to beans that grow in a soil without batteries and are exposed to the same germination conditions.
- ✓ Bean plants grow in a soil where there are batteries will have a slower growth compared to beans that grow in a soil without batteries and are exposed to the same germination conditions. Such plants do not develop a flower or fruit because during development they begin to dry out and decay.