SANISOL

A pilot tool for recommendations to vegetable and fruit producers on contaminated soil in Wallonia (Belgium)

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26 mars 2019

SANISOL project

- Soil-Plant transfer modeling and sampling soil and vegetables
- Diagnosis of the S-Risk model and its conditions of use in the context of plant production
- Biomonitoring
- Realization of a computer tool for the gardeners and market gardeners
- Communication management

Lead contents in Walloon soils

Lead contents in Walloon soils of collectives kitchen gardens
Vegetables contamination

Soil pollution?

Risk to human health?

Vegetables and fruits contamination?

Soil concentration > threshold value

Vegetables contamination

Soil pollution?

Risk to human health?

Vegetables and fruits contamination?

Collective garden of Bressoux
6 ha - 250 parcels - 200 families
251 vegetables/fruits sampled

Vegetables contamination

Soil pollution?

Risk to human health?

Vegetables and fruits contamination?

Soil concentration > threshold value

Fertility
pH, organic matter, nutritive elements

Vegetables contamination

Soil pollution?

Risk to human health?

Vegetables and fruits contamination?

Soil concentration > threshold value

Vegetables and fruits contamination?

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Soil pollution?

Risk to human health?

Vegetables and fruits contamination?

Soil concentration > threshold value
Risk assessment for human health

**Step 1**
- Identification of risks
- Realization of the conceptual site model

**Step 2**
- Definition of dose / response relationships (reference toxicological value)

**Step 3**
- Exposure evaluation

**Step 4**
- Characterization of the risks

**Definition of dose / response relationships**

**Characterization of the risks**

**Lead**: Exceeding the acceptability threshold (P50 soil-vegetables):
- Soil ingestion: Children (IR = 64 to 120) – Adult (IR = 7 to 13)
- Vegetables ingestion: Children (IR = 12 to 94) – Adult (IR = 4 to 24)

**Arsenic**: Exceeding the acceptability threshold (P50 soil-vegetables):
- Soil ingestion and vegetables ingestion: 1 cancer per 10,000 people

→ Biomonitoring for gardener population

**Biomonitoring**

- 88 adults
- 5 children
- 93 urine samples
- 85 blood samples
- 35 hair samples
- 91 completed questionnaires

Arsenic, cadmium, copper, mercury, molybdenum, lead, zinc
Biomonitoring

88 adults

6 adults
Impregnation < vigilance value for all biomarkers

37 adults
Impregnation > vigilance value for minimum one biomarker

45 adults
Impregnation > intervention value for minimum one biomarker

The impregnation rates of sampled people are too high in arsenic, cadmium and lead.

SANISOL tool

- Soil properties (fertility and metals)
- Metal concentrations in vegetables (not mandatory)
- Eating habits
- Gardener profile

Improvement of:
- Soil-plant transfer equation
- Bioavailability and bioaccessibility of metals

- Vegetable crops
- Gardening tips
- Precautionary measures

Finally, we stay the results of SANISOL project in May 2019.
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Recommendations with respect to:
- crops which can to be cultivate
- risky activities
- precautionary measures

Thank you for your attention...

Additional recommendations:

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