



Long-term crop rotation trial in Finland

-MultiSoil project

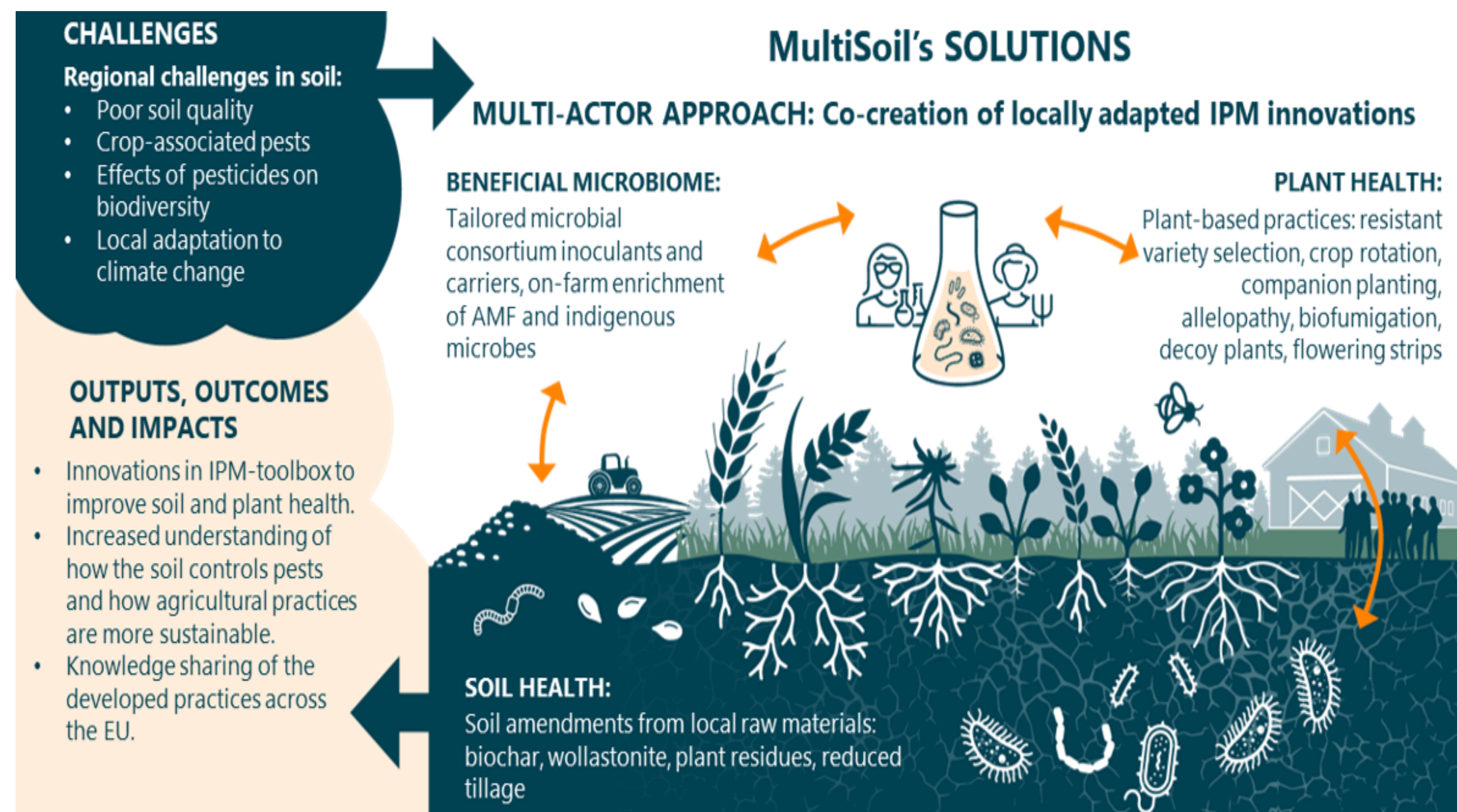


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MultiSoil-project contributes to Horizon Europe's Mission "A Soil Deal for Europe" which specific objectives is to **reduce soil pollution by improving soil biodiversity and crop production**. Soil organic amendments, microbial inoculants, and diversified cropping systems are co-developed with local actors into innovations to complement Integrated Pest Management (IPM) practices. Their site-specific effectiveness is analyzed, and sustainability is assessed in experimental field trials and demonstration sites covering 6 European pedoclimatic zones.



Aim of long-term crop rotation trial in Finland

Since 2015, long-term crop rotation trial with 14 different crop rotations has been under research in Sugar Beet Research Centre in Finland. The aim is to assess the value of sugar beet as a pre-crop and monitor the differences to the soil microbial activities, biodiversity and soil quality with different crop rotations.

Methods

14 different crop rotations were compared: **sugar beet** (*Beta vulgaris*) monoculture, **spring wheat** (*Triticum aestivum*) monoculture, sugar beet two year in a row and sugar beet in every second, third and fourth year. Other crops in crop rotations are **spring turnip rape** (*Brassica rapa* subsp. *oleifera*), **field pea** (*Pisum sativum*) and **green manure** crops.

In the trial the plot size is 50x12 meter with two replicates. Plots were plowed annually in the autumn and trial was limed in 2024.

Fertilizer levels followed EU agricultural directive and varied within different crops:

- Sugarbeet 140 kg N/ha
- Cereals 100 kg N/ha,
- Spring turnip rape 80 kg N/ha
- Field pea 30 kg N/ha.

Only mineral fertilizer were used.

Soil health parameters from different rotations will be monitored as follows:

2021-2023 SOC and soil fertility

2023-2025 soil fertility and microbiological content

2026-2029 soil microbial activity, SOC, soil fertility



Figure 1. Crop rotation trial site.

Preliminary results

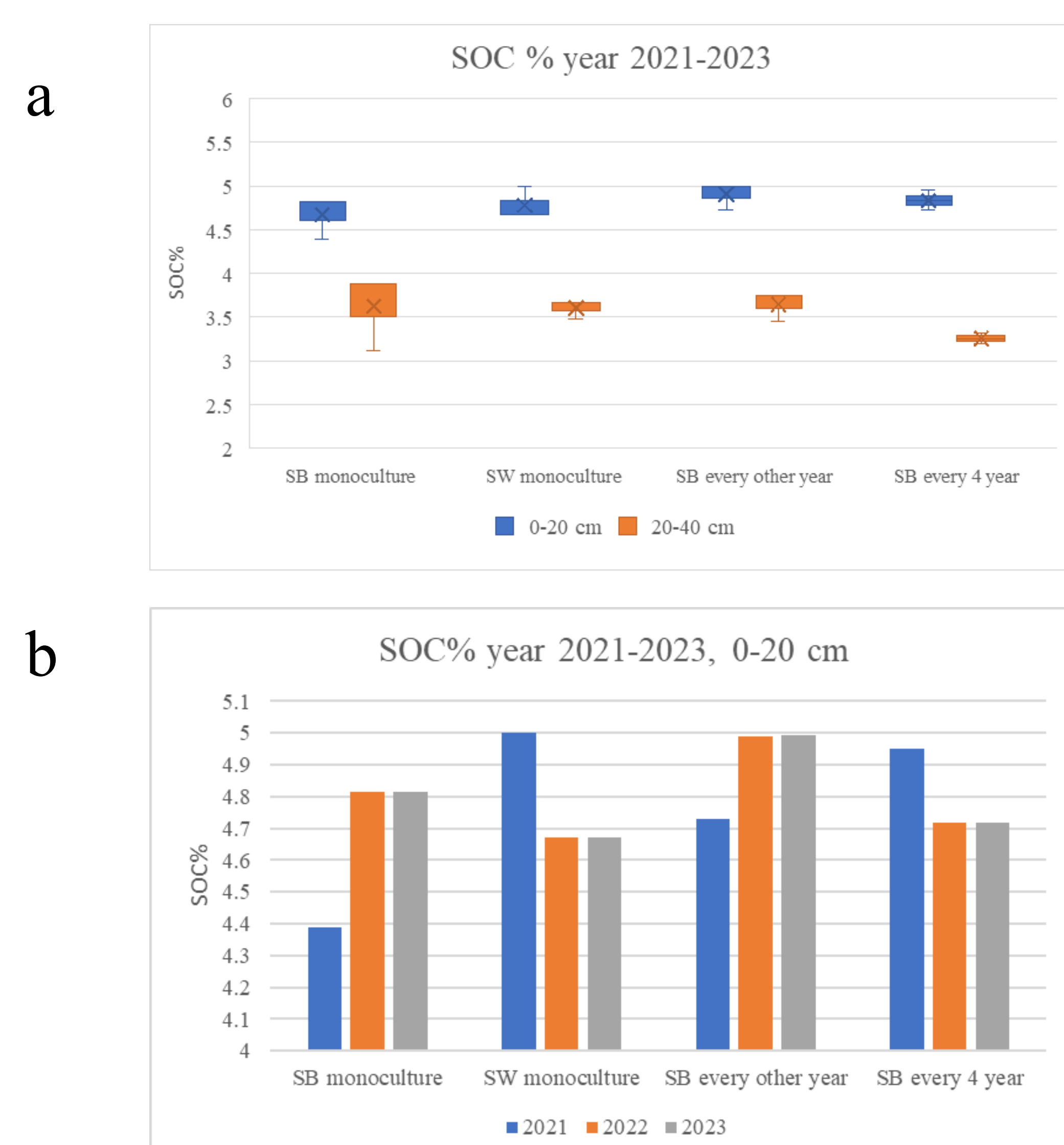


Figure 2a and 2b. Difference of soil organic carbon (SOC) between four different crop rotations in different soil depth (Figure 2a) and different years 2021-2023 (Figure 2b).