

Si4Crop: FIELD TRIAL REPORT

Silicon (Si) is a beneficial element for plants, known for enhancing their tolerance to various biotic and abiotic stresses. Plant-based food is the main source of Si for humans and animals, considering its importance for the structure of bones and collagen tissues. In this context, the application of silicon fertilizers can be one of the ways to mitigate stressful conditions to which crops are constantly exposed, as well as to improve the nutritional status of food.

The main goal of the work package "Demonstration of Results in Field Conditions" from the "Si4Crops21" project is to develop a strategy to increase the efficiency of applied silicon and better uptake of essential micro- and macroelements in economically important agricultural crops (wheat and corn). At the same time, the experimental fields aimed to raise awareness among agricultural producers, as well as the broader community, about the importance and benefits of applying silicon-based fertilizers.

Micro-experimental field trials of wheat and corn were organized at the experimental plots of the Agricultural Advisory Service Zrenjanin, location Zlatica.

Wheat Demonstration plot

1.1. Agronomic and Experimental Data:

Soil type: Chernozem

Preceding crop: Corn

Sowing date: October 25, 2023

Variety: *Sacramento*

Plot size: 12.5 m²

Treatments (with 5 replicates):

- a) 50 kg silicon (K₂OSi₃) per hectare; (December 28, 2023)
- b) 150 kg silicon (K₂OSi₃) per hectare; (December 28, 2023)
- c) Potassium compensation (KCl) for treatment a); (December 28, 2023)
- d) Potassium compensation (KCl) for treatment b); (December 28, 2023)

- e) Foliar application (1 mM silicon acid, 700 L/hectare); (April 12, 2024, April 25, 2024, May 10, 2024)
- f) Control (0 kg Si)

Sampling:

- a) Soil (before sowing on October 25, 2023; after grain filling stage on April 25, 2024; post-harvest on June 26, 2024)
- b) Plant (tillering on March 28, 2024; flag leaf on April 5, 2024; after grain filling stage on May 10, 2024)

Harvest: June 26, 2024.

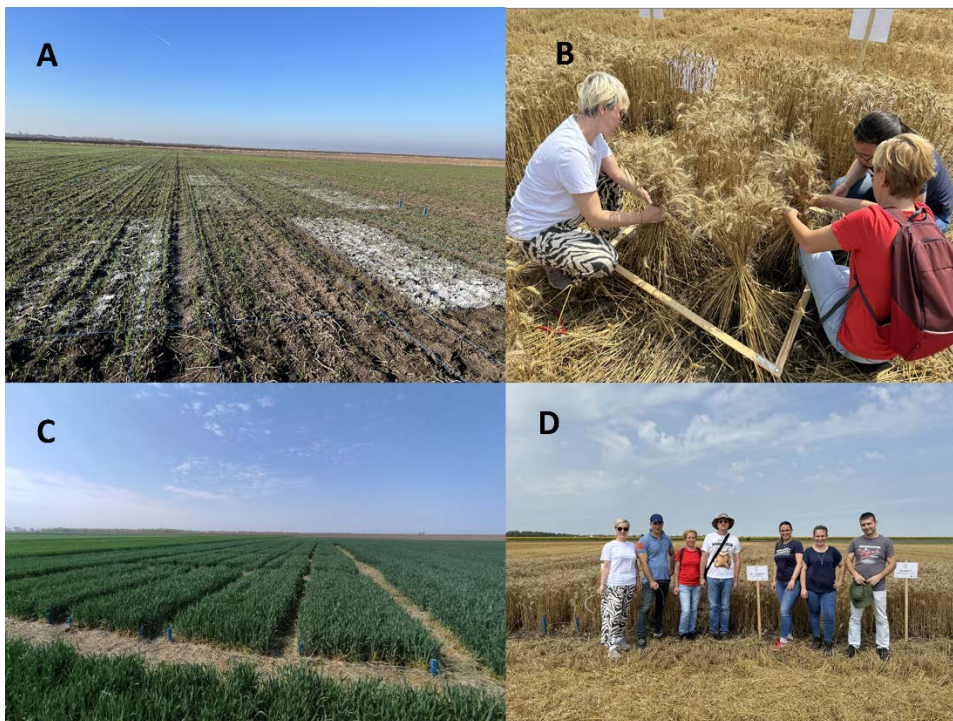


Figure 1. Experimental setup of wheat plots at the Zlatica location, Zrenjanin, after the application of silicon fertilizer (A); during the foliar silicon treatment (C); experimental plots just before harvest (D); and at harvesting day (B).

Maize Demonstration plot

2.1. Agronomic and Experimental Data:

Soil type: Chernozem

Preceding crop: Wheat

Sowing date: April 25, 2024.

Hybrid: DKC 5709

Plot size: 14 m²

Fertilization: 300 kg/ha 15:15:15 on November 24, 2023. 17 kg/ha Urea on April 16, 2024

Treatments (5 replicates):

- a) 50 kg silicon (K₂O Si₃) per hectare; (May 15, 2024)
- b) 150 kg silicon (K₂O Si₃) per hectare; (May 15, 2024)
- c) Potassium compensation (KCl) for treatment a); (May 15, 2024)
- d) Potassium compensation (KCl) for treatment b); (May 15, 2024)
- e) Foliar application (1 mM silicon acid, 700 L/ha); (July 5, 2024, July 12, 2024, July 19, 2024)
- f) Control (0 kg Si)

Sampling:

- a) Soil (before sowing on October 25, 2023; post-harvest on September 4, 2024)
- b) Plant (tasseling on July 5, 2024)

Harvest: September 4, 2024.

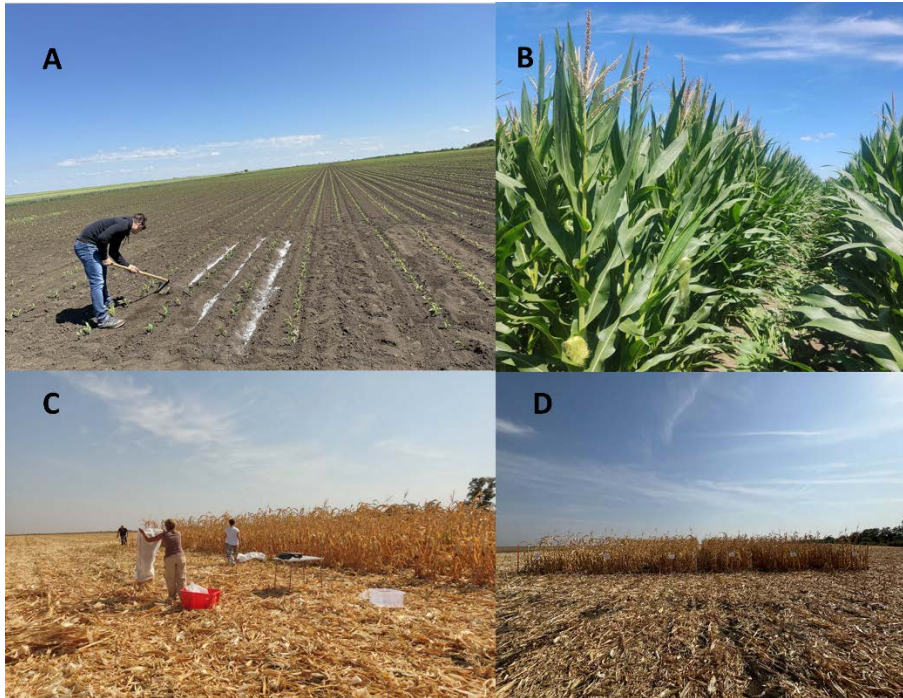


Figure 2. Experimental setup of maize plots (A) at the Zlatica location, Zrenjanin, after the application of silicon fertilizer; foliar silicon treatment (B); experimental plots at harvest day (C and D).