

BIOFORTIFIED AND CLIMATE-RESILIENT FOOD AND FODDER PRODUCTION ON MARGINAL SOILS

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Rationale and aims of study

To combat the decreasing productivity of arable soils and progressive climate changes, the BioFoodOnMars project will develop new opportunities to increase the amount and quality of food and feed crops in Europe using new strategies for sustainable growth of plant production and increasing climate change resilience of agroecosystems.

This project aims at mapping potential crop yields and the valorization opportunities on marginal soils under various regional conditions in Europe and trying to optimize the biomass production and valorization with biofertilizers or soil additives, like silicon, or management changes supported by remote sensing and digitalization. The project is dividend in 6 workpackages. The aim of the first summer was to test the potential of silicon amendments to reduce biotic and abiotic stress on fields, while monitoring it remotely, and for climate adaptation using an ecotron.

Materials and methods

Spring barley cv Fantex was grown in 2020 on the experimental fields in Estonia, Lithuania, Poland, Germany and France and in ecotron in Belgium.

The experiment was set up in randomized block design with four replicates of each treatment and plot size was 10-20 m².

Treatments:

1. Control (no fertilizer); control + Se; Control +Si; Control +Se +Si

2.N100P80K140; NPK + Se; NPK+ Si; NPK+ Si+Se

Selenium foliar application (dose 2 x 5g Se (Na₂SeO₄)) was applied twice (at tillering and stem elongation)

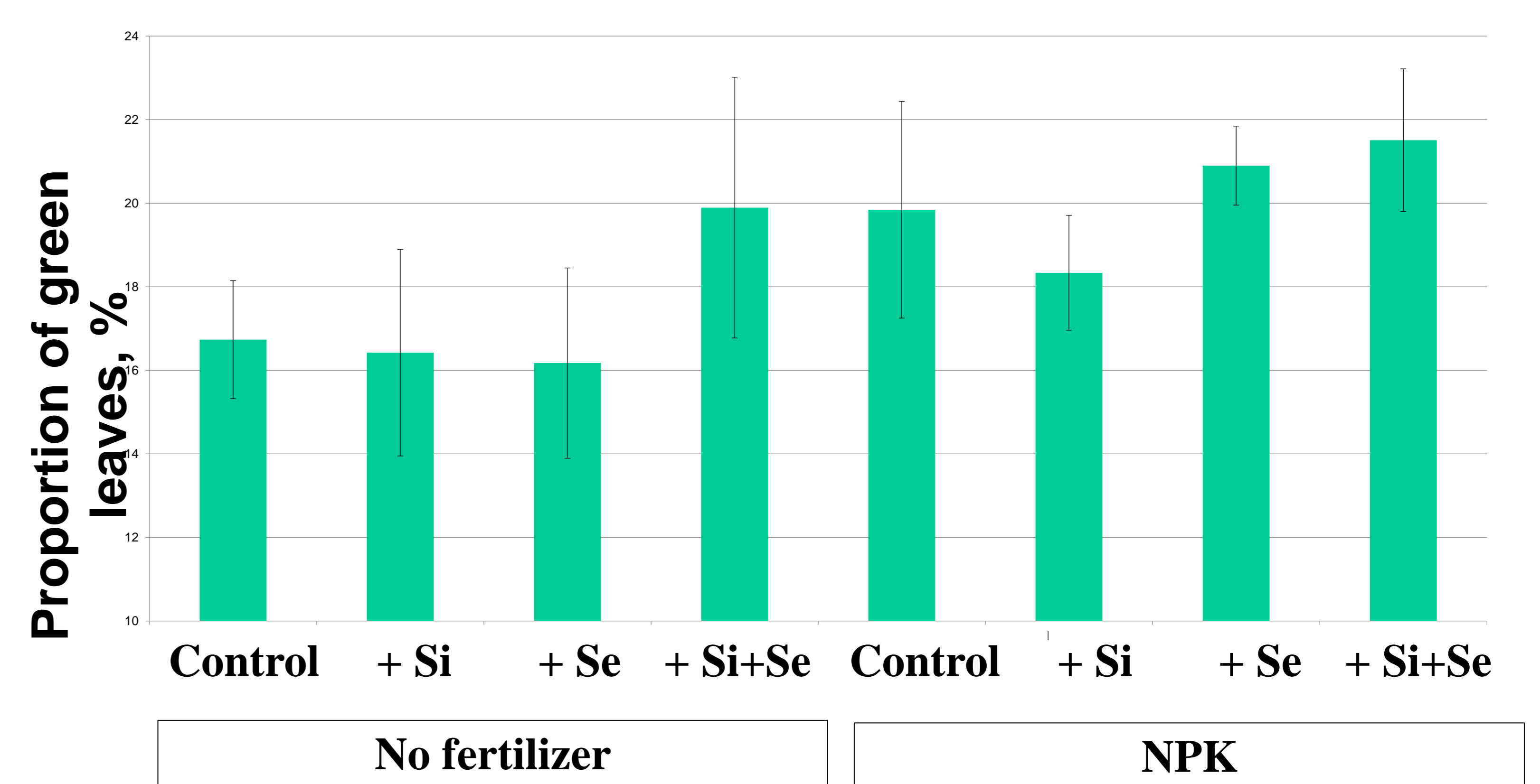
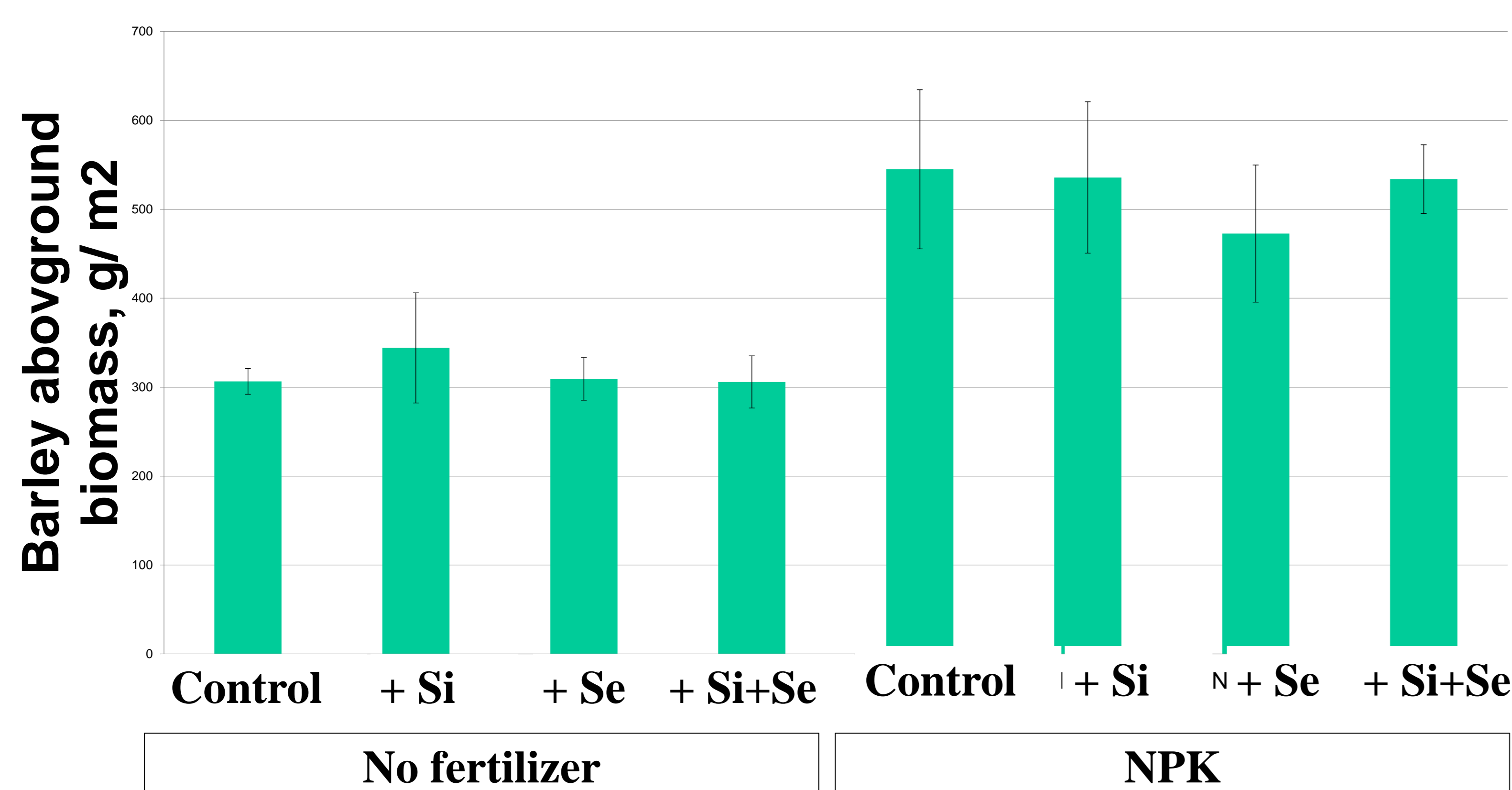
Silicon (0,5 L/ha Optisyl) was applied three times (at tillering, stem elongation, and heading).

Monitoring of plant yield, pathogen prevalence, soil nutrients and nitrate leaching.



Results

Based on preliminary results, the average aboveground biomass nor the proportion of green leaves of barley did not differ in between treatments in Estonia at BBCH 73.



Silicon amendments in Lithuania resulted in greener fields, as detected by remote sensing.



Ecotron Picture and a sentece or two?

Discussion and conclusions