



Theme 1

Status and trends of global soil nutrient budget



Contributions of chiseling and winter cover crops on soil fertility and biomass yield in maize for silage production

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INTRODUCTION

The climate and the predominant animal husbandry system in Southern Brazil make maize crops for silage production strategic for food security of dairy herds. This study aimed to evaluate the effects of chiseling and winter cover crops on soil chemical attributes and aboveground biomass yield of winter cover crops and maize crop.

METHODOLOGY

STUDY AREA

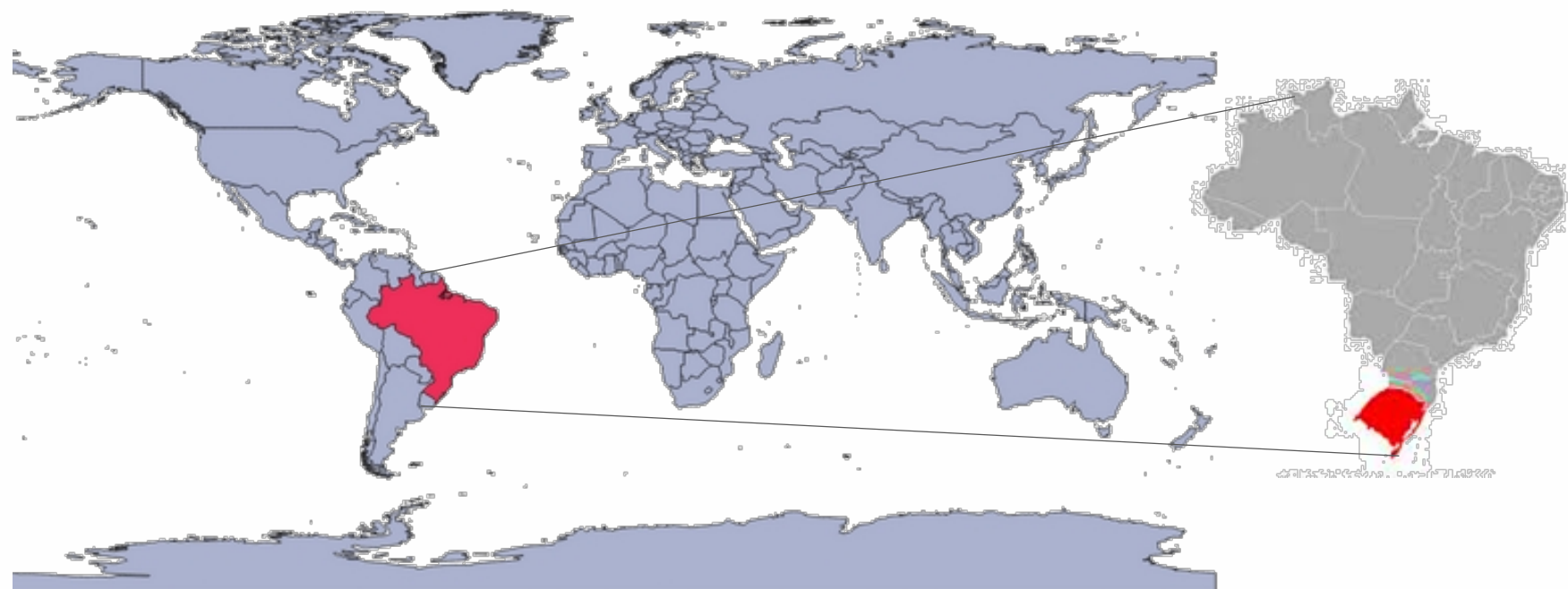


Figure 1. Brazilian boundaries in global political map, and location of Rio Grande do Sul State in Brazil

- Location: Roca Sales Municipality, Rio Grande do Sul State, Brazil.
- Soil texture: clay loam texture (33% clay content)
- Soil type: Inceptisols



Figure 2. Top view from field experiment during winter season. Experiment design consists of completely randomized blocks in split plot (3 replications)

SAMPLING AND ANALYSIS

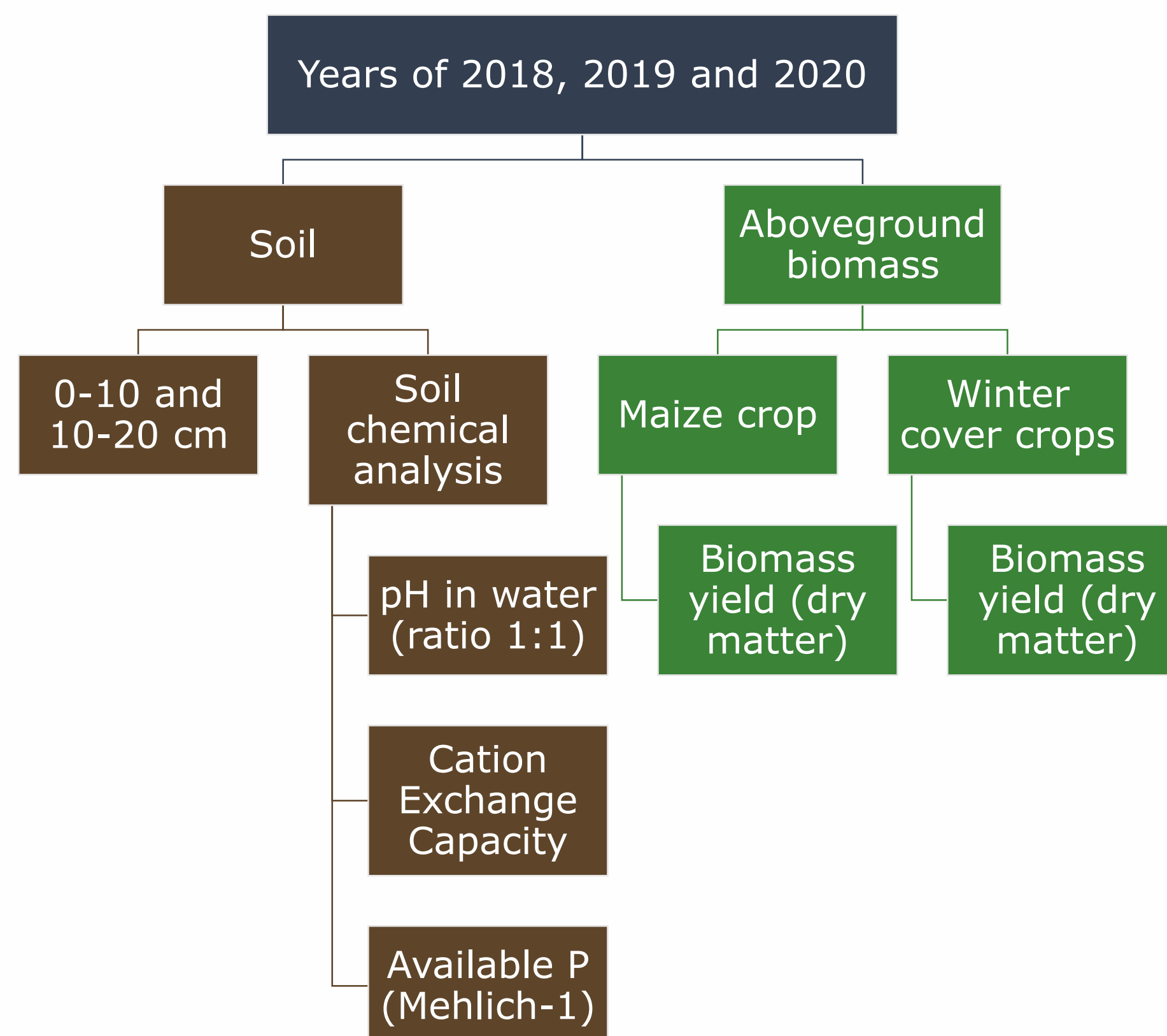


Figure 3. Diagram of soil and plant sampling times and analysis

The results were analyzed according to linear mixed model, considering the soil layers independently ($p < 0.05$). Pairwise comparison was performed as a *post hoc* analysis.

RESULTS

SOIL FERTILITY

Soil mobilization affects soil fertility

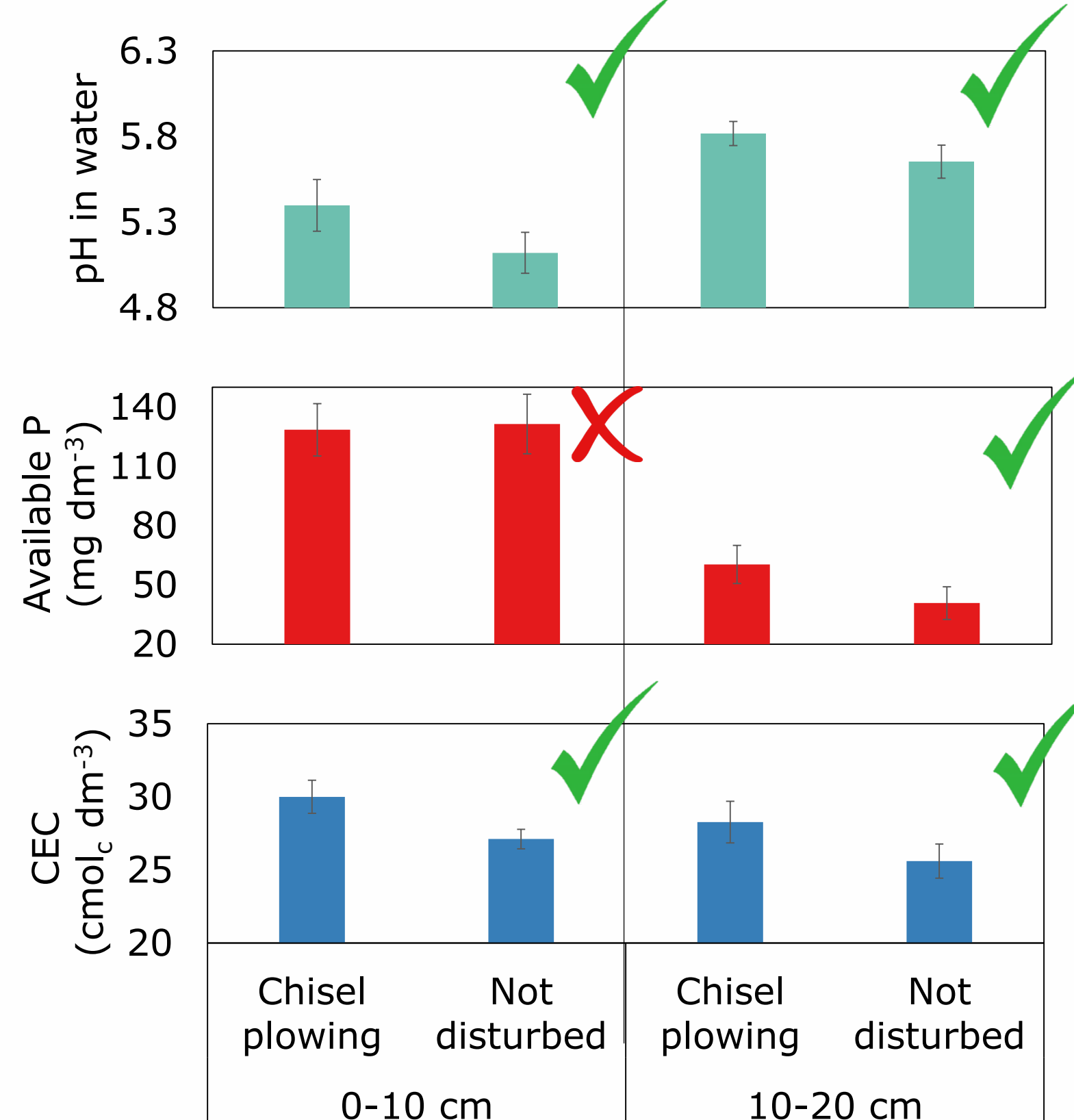


Figure 4. Soil chemical attributes in sampled layers according to soil mobilization

Winter cover crops affects soil fertility

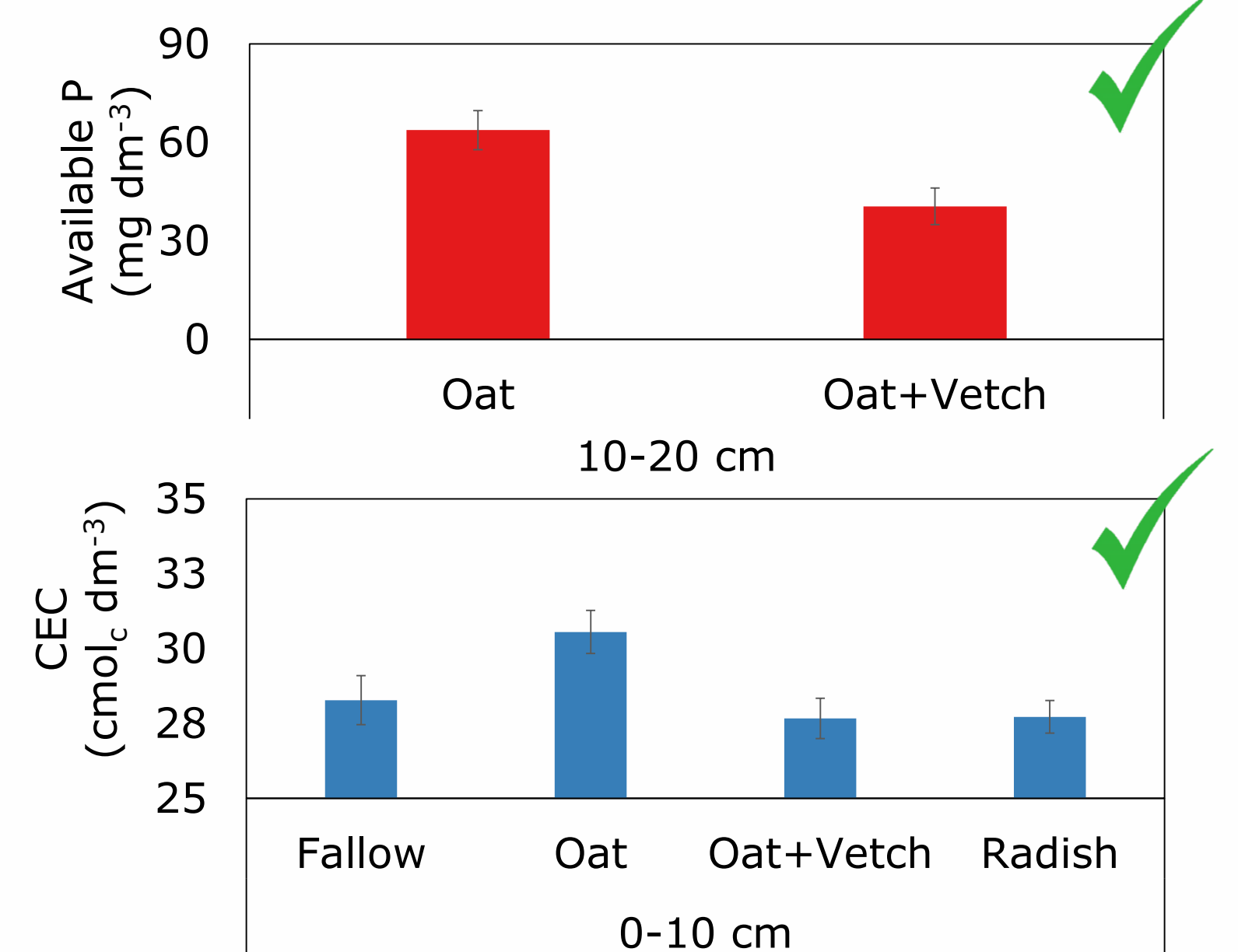
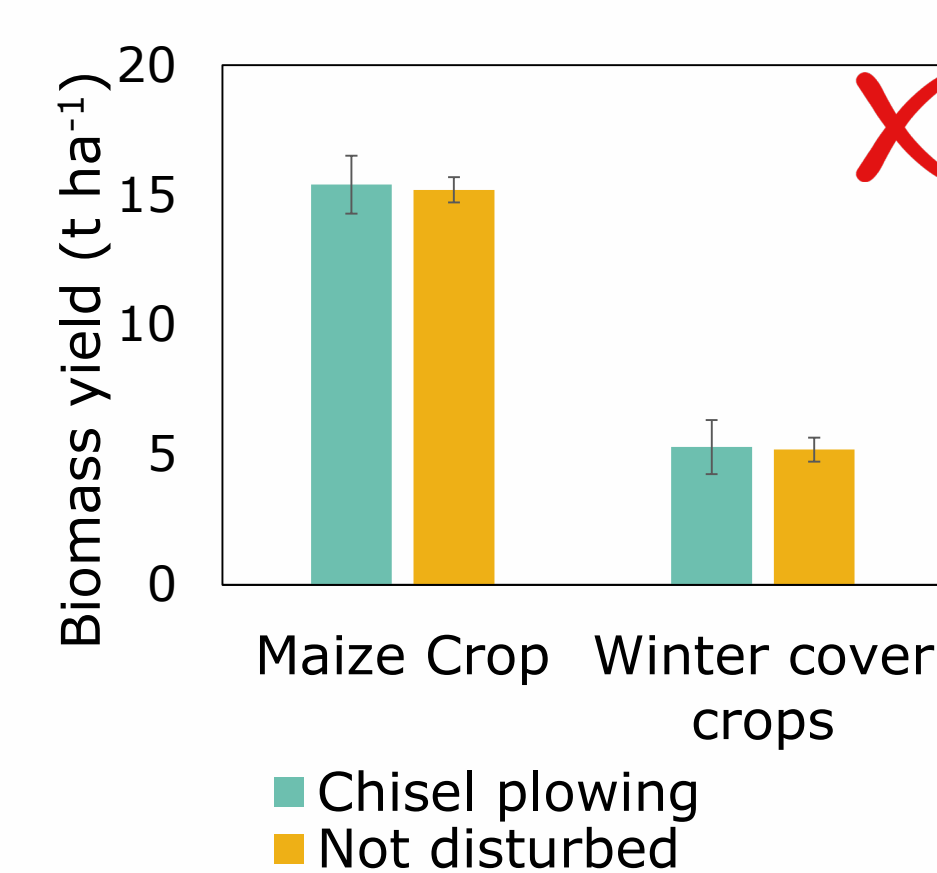


Figure 5. Soil chemical attributes in sampled layers according to winter cover crops

BIOMASS YIELD

Soil mobilization don't affect biomass yield



Winter cover crops affect biomass yield

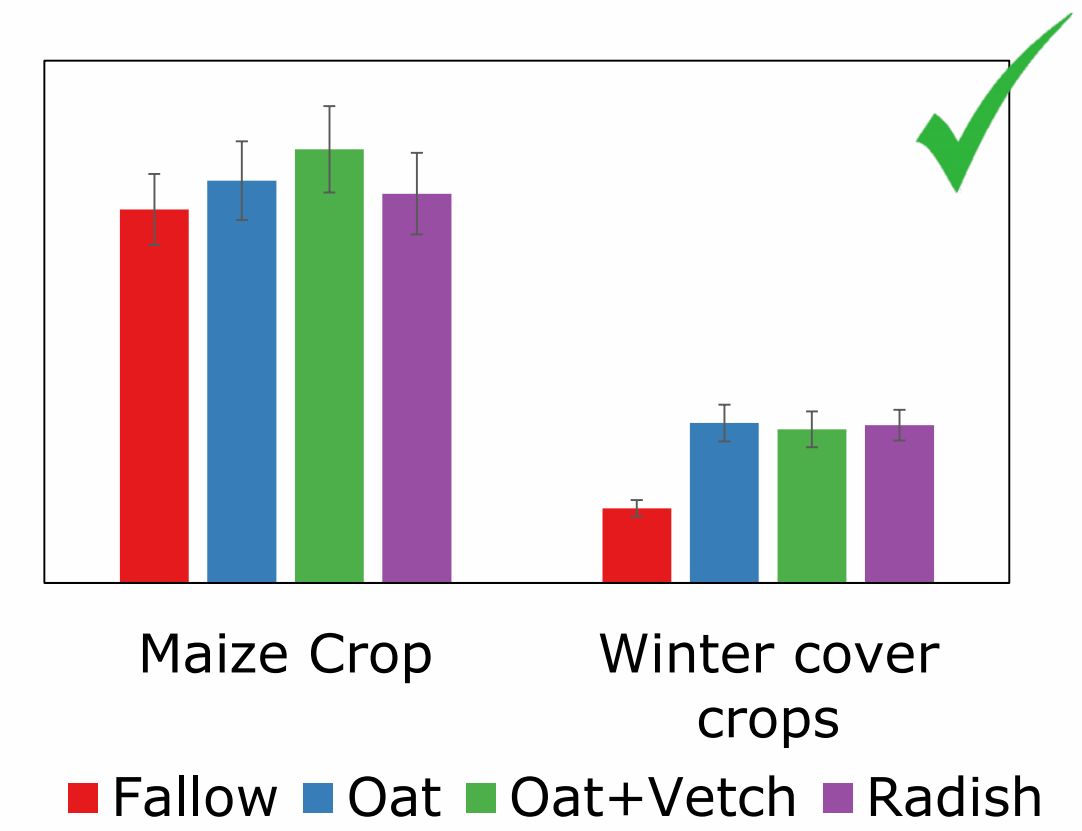


Figure 6. Aboveground biomass yield of maize crop and winter cover crops according to soil mobilization and to cover crops

CONCLUSIONS

In general, chisel plowing and winter cover crops contributed to increase soil nutrient availability, although no influence of chiseling was noticed in aboveground biomass. At first sight, chisel plowing may be dispensable to maintenance of maize yield, but in the long run this soil management can contribute to crop resilience as it improves soil fertility conditions.

ACKNOWLEDGEMENTS

