



IMPACT OF SUSTAINABLE SOIL MANAGEMENT PRACTICES ON SOIL MICROBIAL BIOMASS CARBON: IMPLICATIONS FOR CLIMATE CHANGE MITIGATION

Amahnui George Amenchwi*, Veronica Ebot Manga, Aaron Suh Tening and Paligwendé Nikiéma

Introduction

- Soil microbial biomass Carbon comprises less than 5% of organic matter but it responds rapidly to changes in soil management (Chen et al., 2015).
- In agroecosystems, soil management practices such as tillage systems and fertilizer types affect soil microbial biomass carbon.
- Information gaps still exist in Africa and Cameroon about the impacts of soil management practices on soil Microbial biomass carbon.

Materials and Methods

- The Study was conducted in Buea, Southwest Region of Cameroon with an equatorial climate.
- The study was conducted for two growing seasons; 2020 (September to December) and 2021 (March to July).
- Hybrid maize CMS 8704 cultivar was used as test crop
- A split plot design was used as plot layout for the experiment.

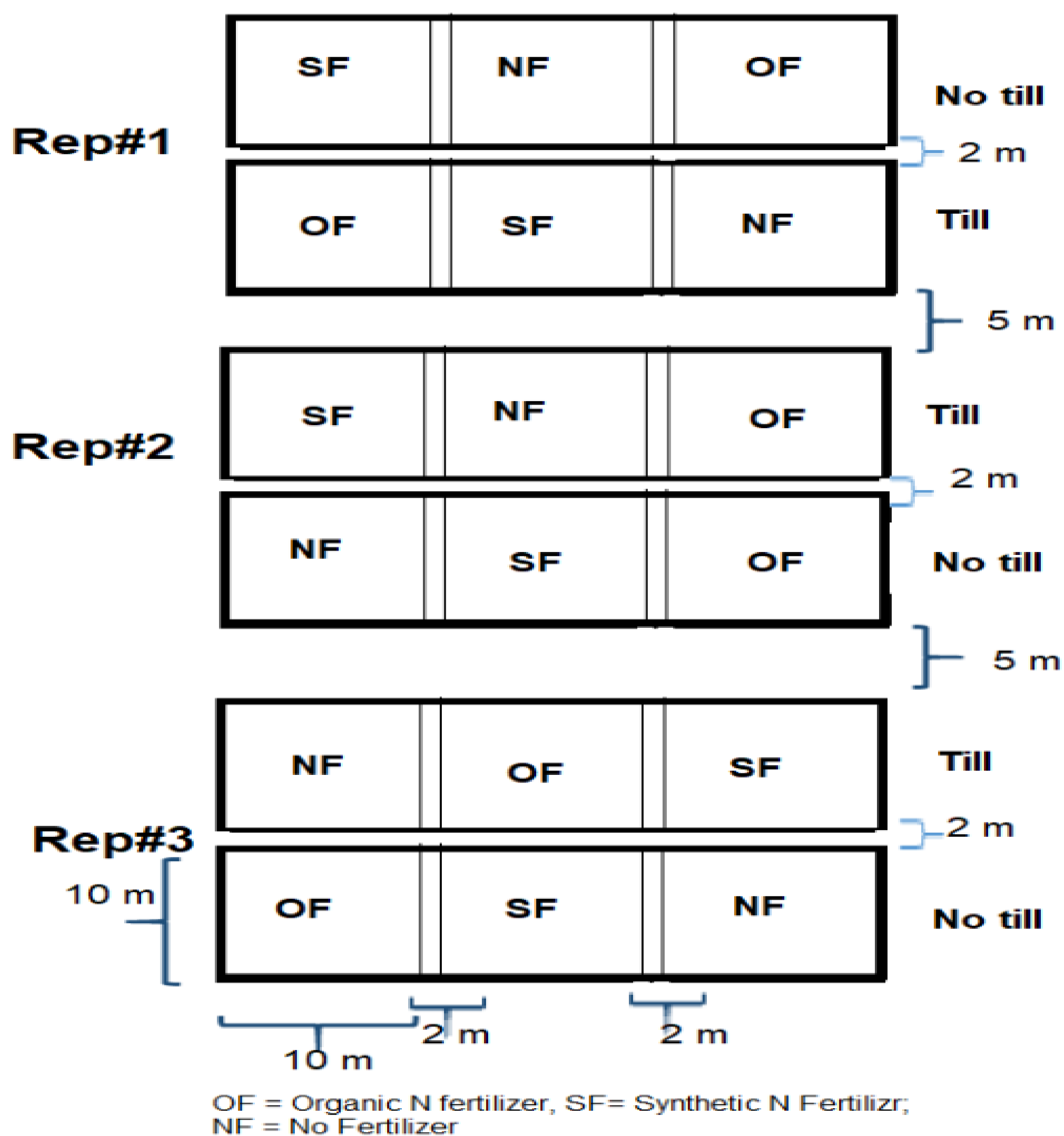


Fig 1: Plot Layout

- Fertilizer types tested was organic (OF), synthetic (SF) and no fertilization (NF).
- Soil samples were collected during each season in three intervals; early, mid and late season corresponding to 4th, 8th and 12th week of crop cultivation, respectively.
- Soil microbial biomass carbon was analyzed in the laboratory using chloroform fumigation and extraction method (FE).
- The data was analyzed using ANOVA in R Software.

Results and Discussion

First growing season (2020): Tillage and Fertilizer had no significant effect on soil microbial biomass carbon.

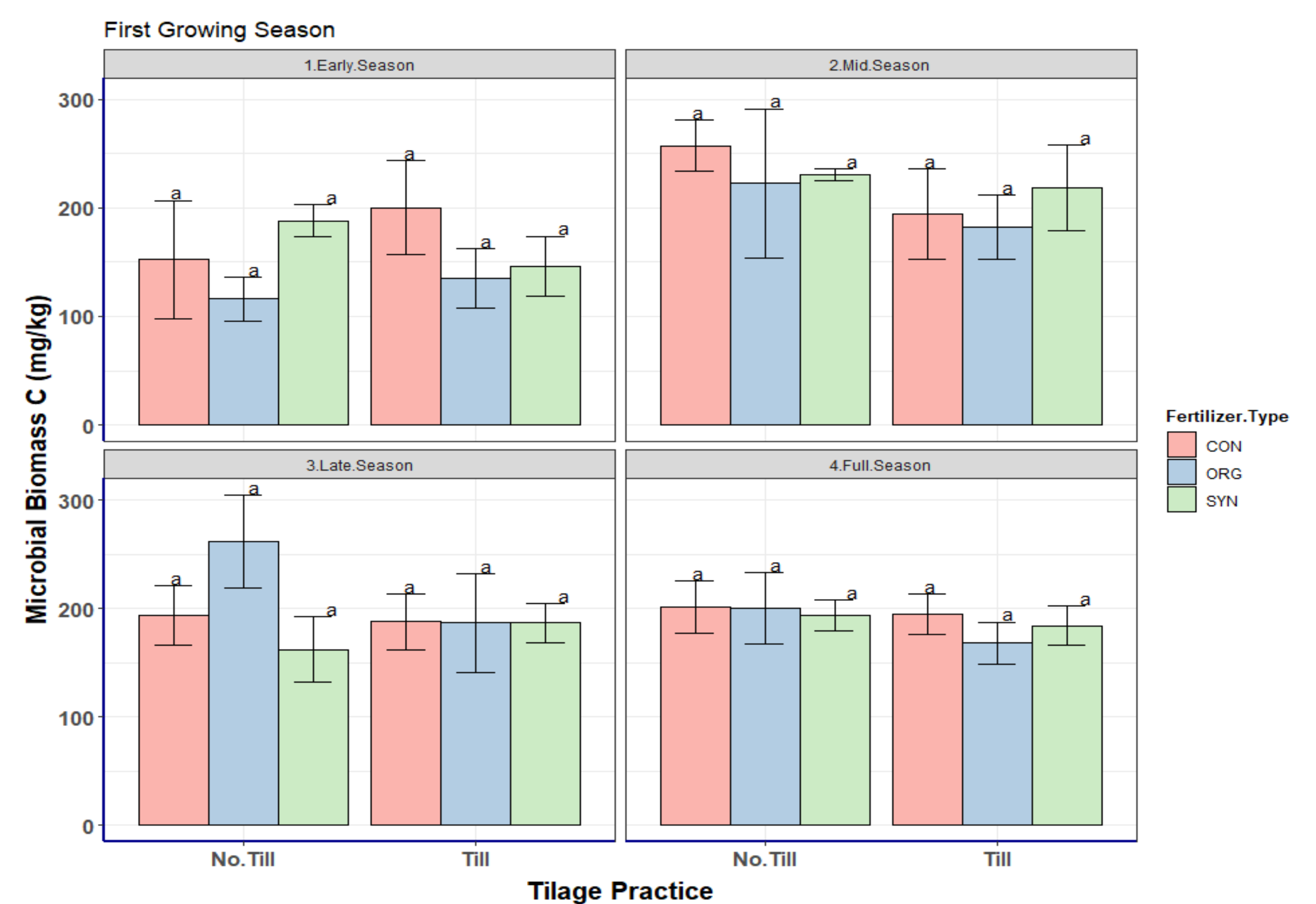


Fig 2: Summarized results for first growing season

Second growing season (2021): Tillage and Fertilizer had no significant effect on soil microbial biomass carbon.

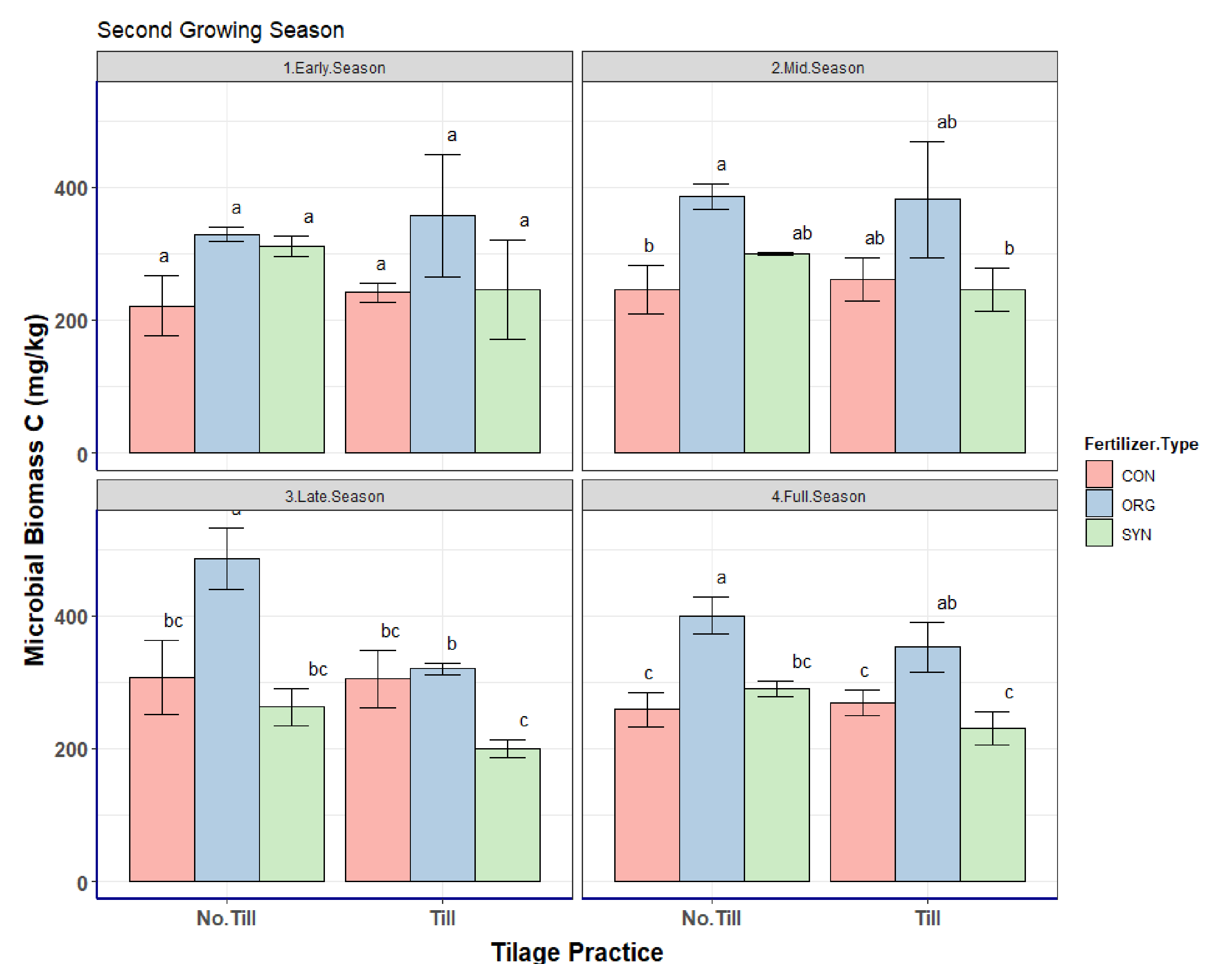


Fig 3: Summarized result for second growing season

- The growing season had a significant impact on soil carbon microbial biomass.

Conclusion

- The study concludes that tillage practices and fertilizer types was insignificant on soil microbial biomass carbon in 2020 and 2021.
- Mean values of soil microbial biomass carbon were statistically different in the second growing season.
- Minimum tillage with organic fertilizer application is recommended in farms in the study area to guarantee carbon sequestration and sustainable farming systems.