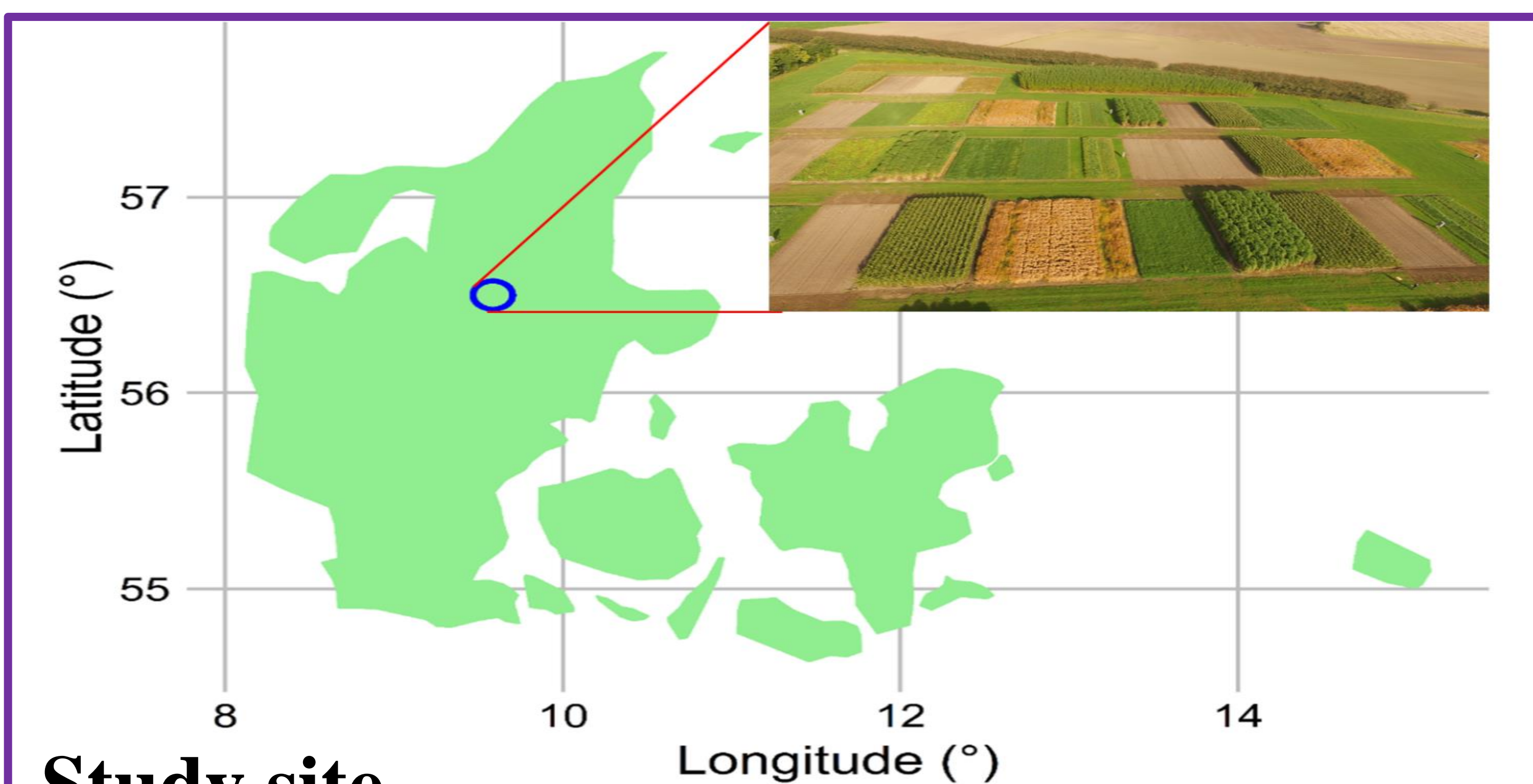


# Carbon balances of annual vs. perennial cropping systems

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## Background & Objectives

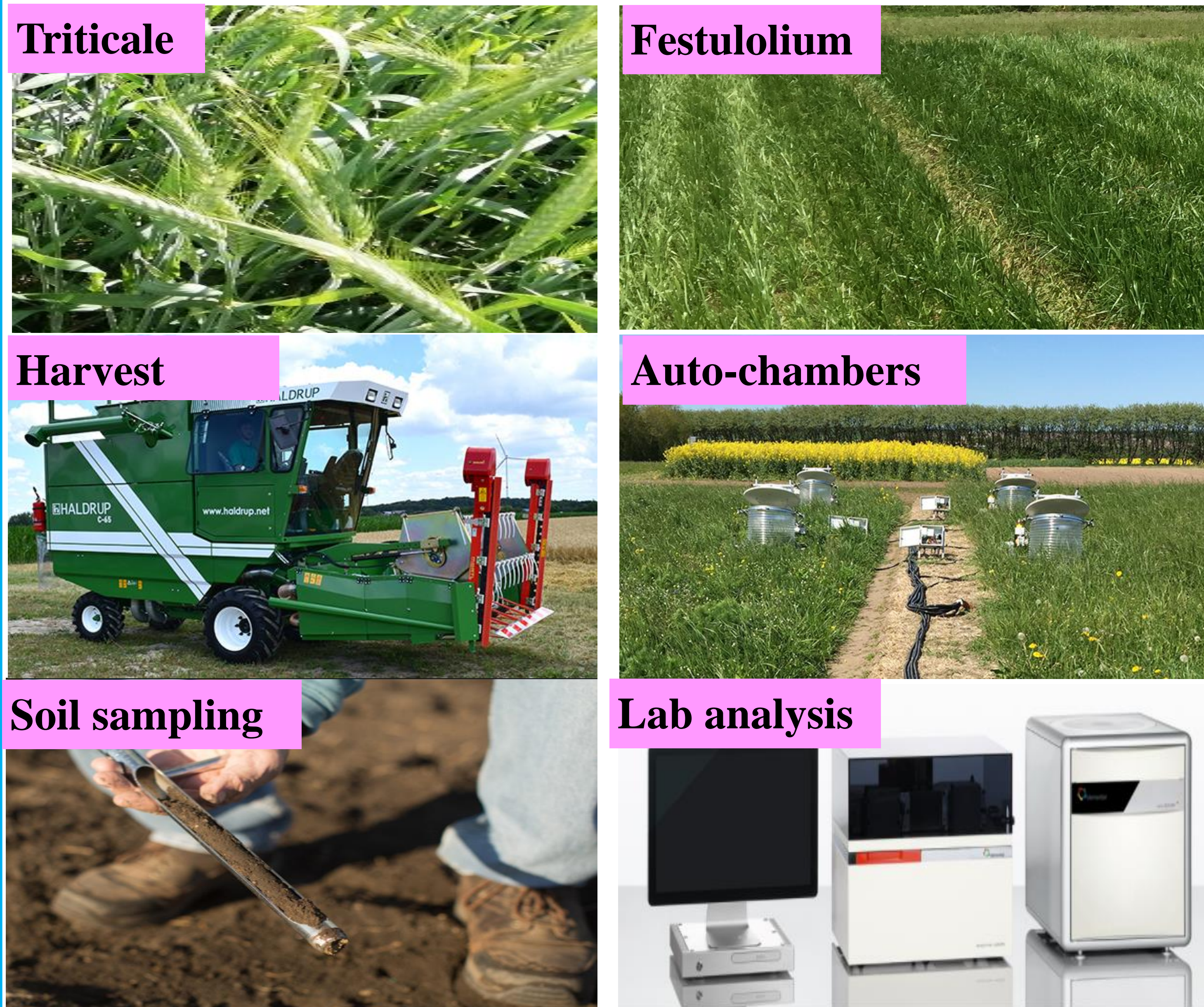
Global demands for agricultural products have substantially increased over the past decades due to the world population explosion as well as due to the growing use of biomass for biorefineries. Attainment of high biomass yield on existing croplands through optimized cropping systems, for example perennial grass are of great importance to meet the global demands for agriculture products. Due to the ongoing rapid climate change and the deteriorating agricultural impacts on environment, sustainable agriculture is required to reduce its environmental C and N. Specifically, agricultural biomass yield for biorefineries should not reduce soil C and N content. The objectives of this study are to investigate C balances of annual and perennial cropping systems.



## Study site

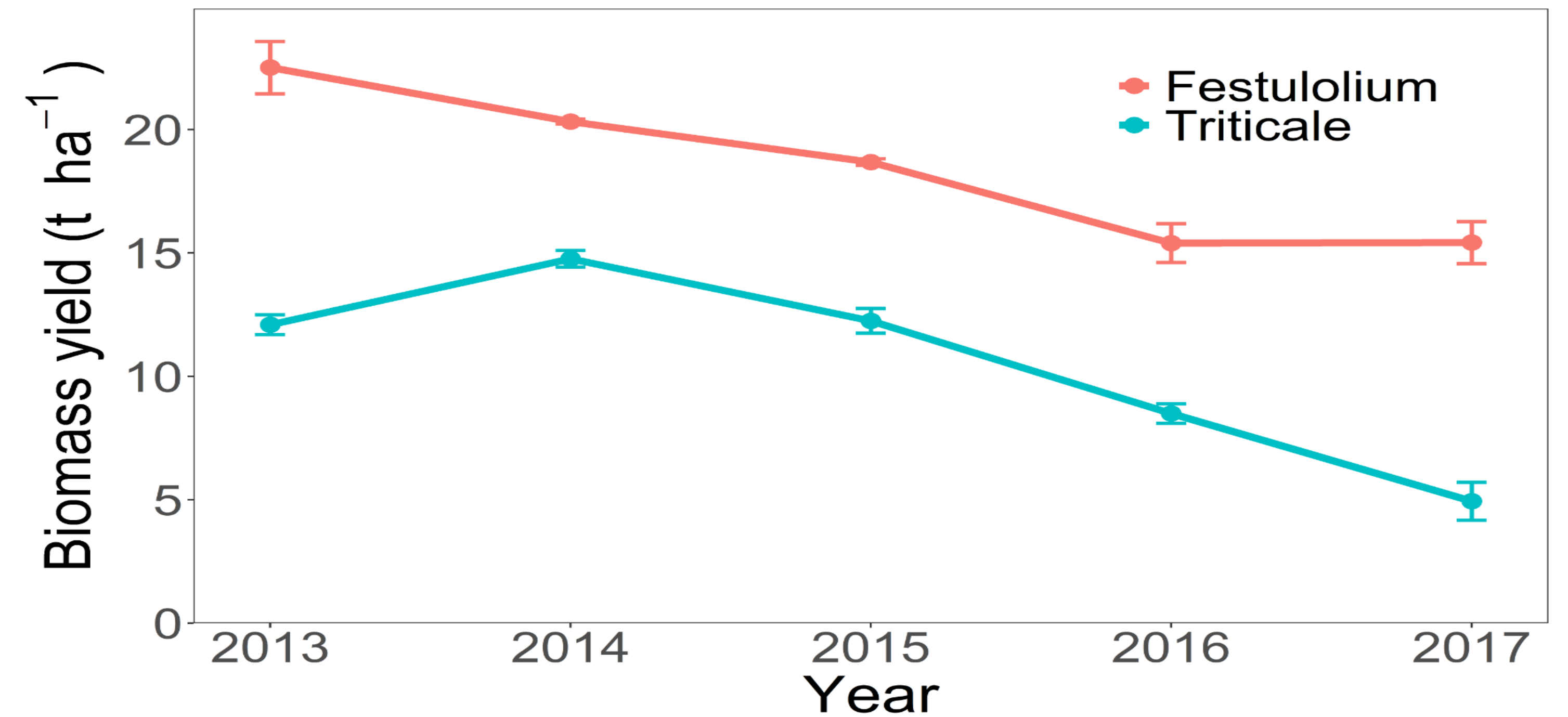
The study was conducted at Research Centre Foulum, Denmark (9°35'E, 56°30'N, 48 m a.s.l.). Soils were Typic Hapludult and sandy loam texture. The mean annual temperature was 7.8 °C, the mean annual precipitation was 740 mm.

## Materials & Methods

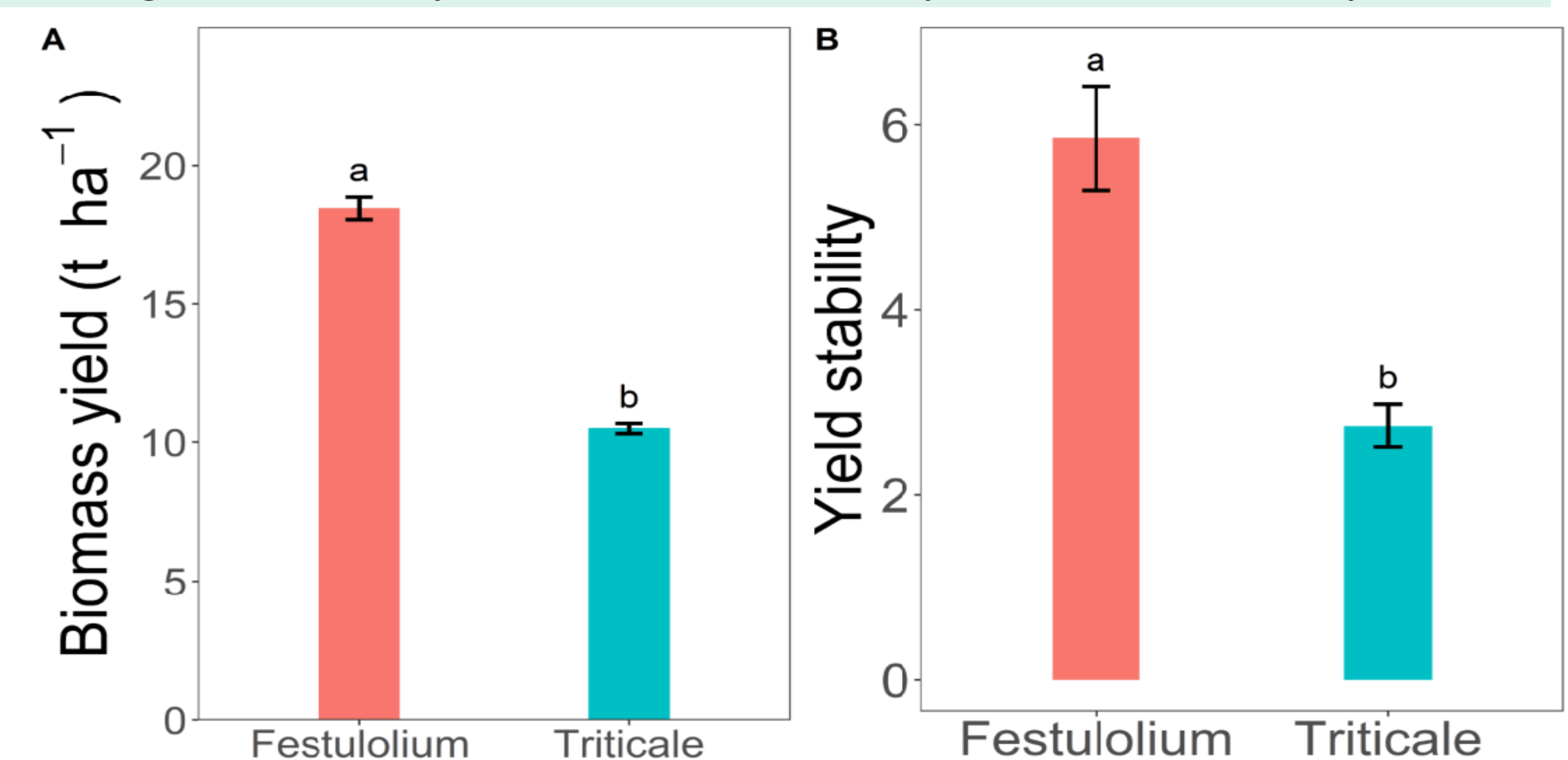


## Results & Discussion

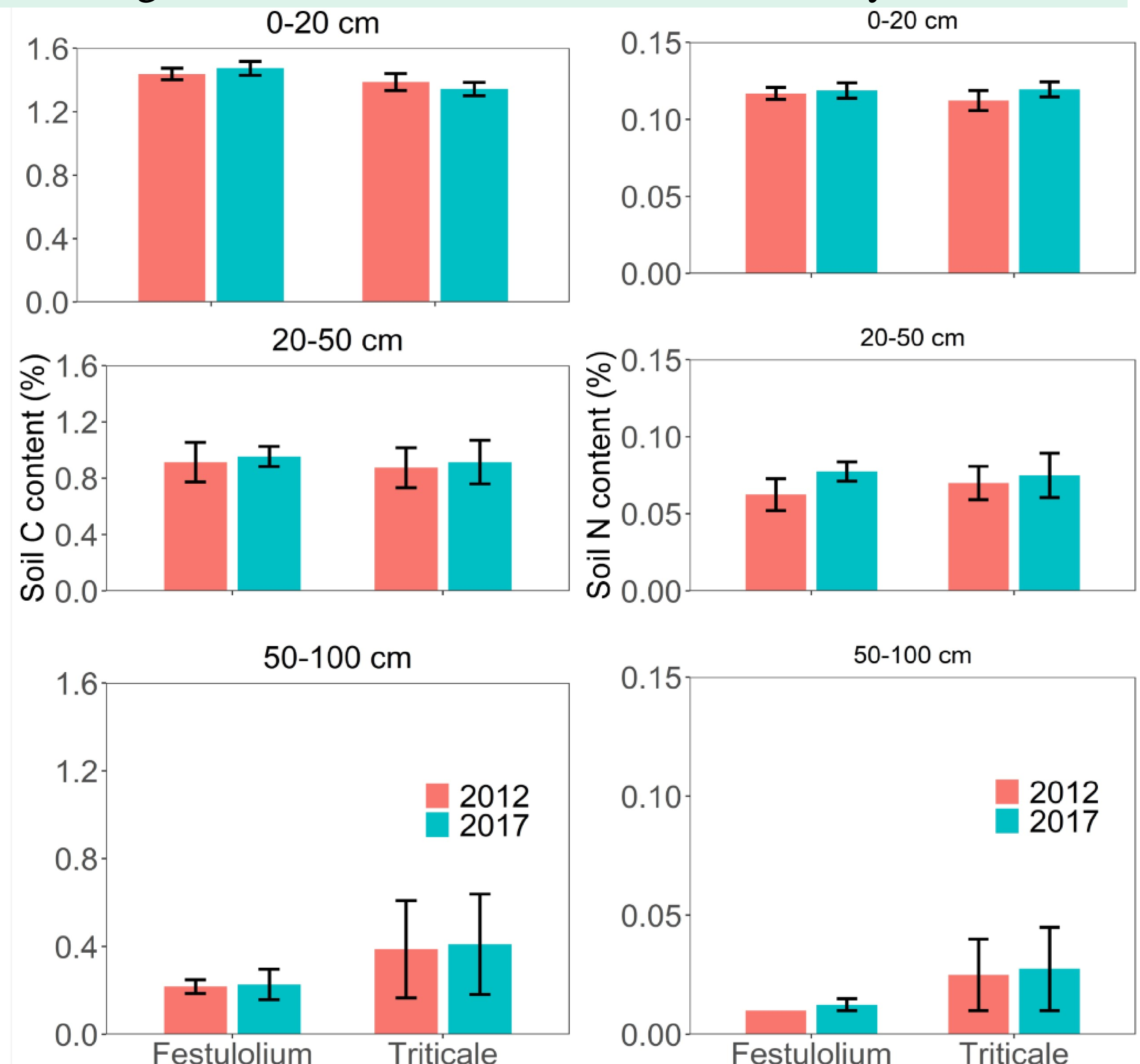
Compared to annual Triticale, perennial Festulolium increased biomass yield and yield stability.



Average biomass yield and its stability across the five years



Unchanged soil C and N content across the five years



## Acknowledgements

AnaEE Denmark, Aarhus University Research Foundation (AUFF-E-2019-7-1), Marie Skłodowska-Curie Individual Fellowship (No. 839806), and NKJ network project.