

## Introduction



Mulched soil

Presence of dry-wet cycles in the sudano-sahelian context

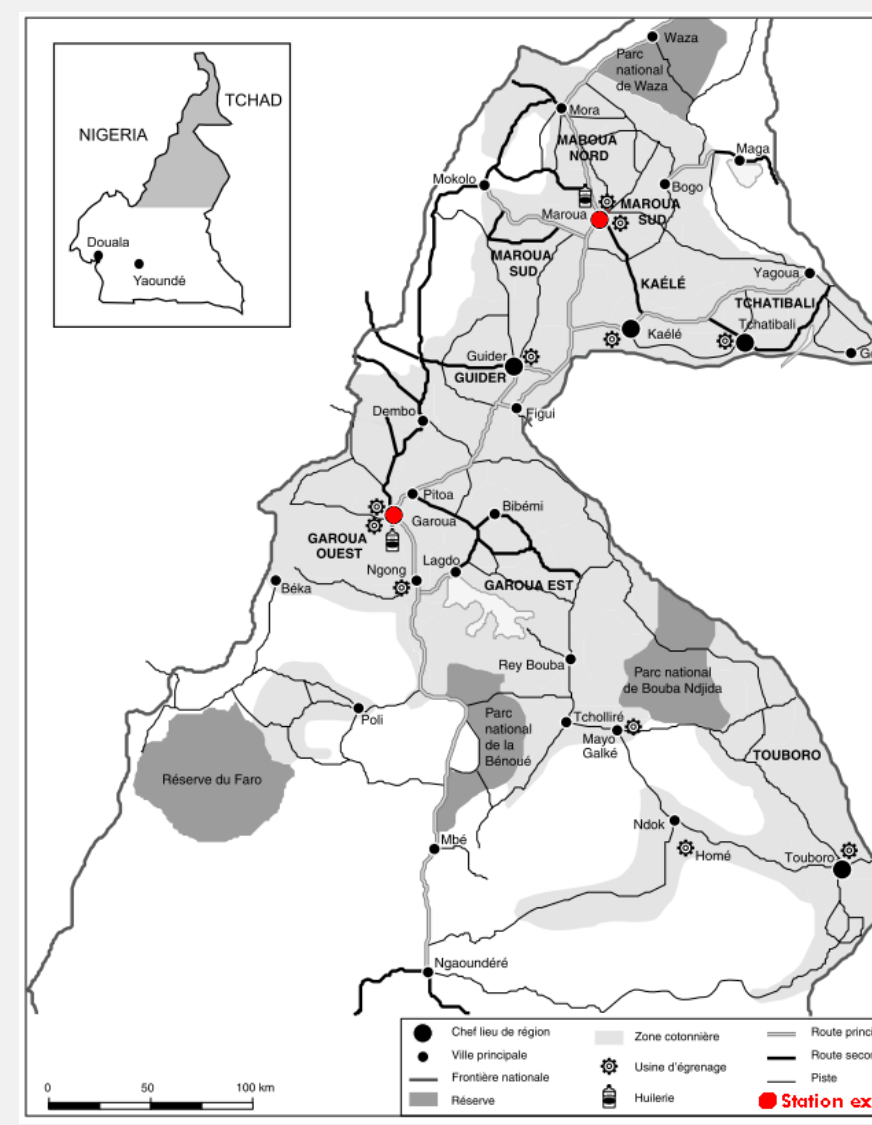


What is the impact of dry-wet cycles on carbon mineralization of mulched soils?

## Objectives :

- To evaluate the influence of dry-wet cycles on carbon mineralization in sudano-sahelian context.
- To evaluate whether the biomass management methods proposed for some years can influence soil carbon mineralization in these dry-wet cycles.

## Materials and methods



The design is a randomized complete block with 6 blocks of 3 plots (2 mx 2 m)

- Three soil moisture treatments:
- dry soils continually (T0)
  - moisted soil and kept moist continually (T1)
  - moisted soil each 10 days (T2)

Soil respiration and soil moisture measurements were made on 50 days using an infrared gas analyzer.

Sudano-Sahelian climate

Mean annual rainfall 800-900 mm

Study is conducted during the dry season (0 mm of rain)

Luvisol, Content of C 1 to 2.5%

C/N ratio of 14-17

0-10 cm depth



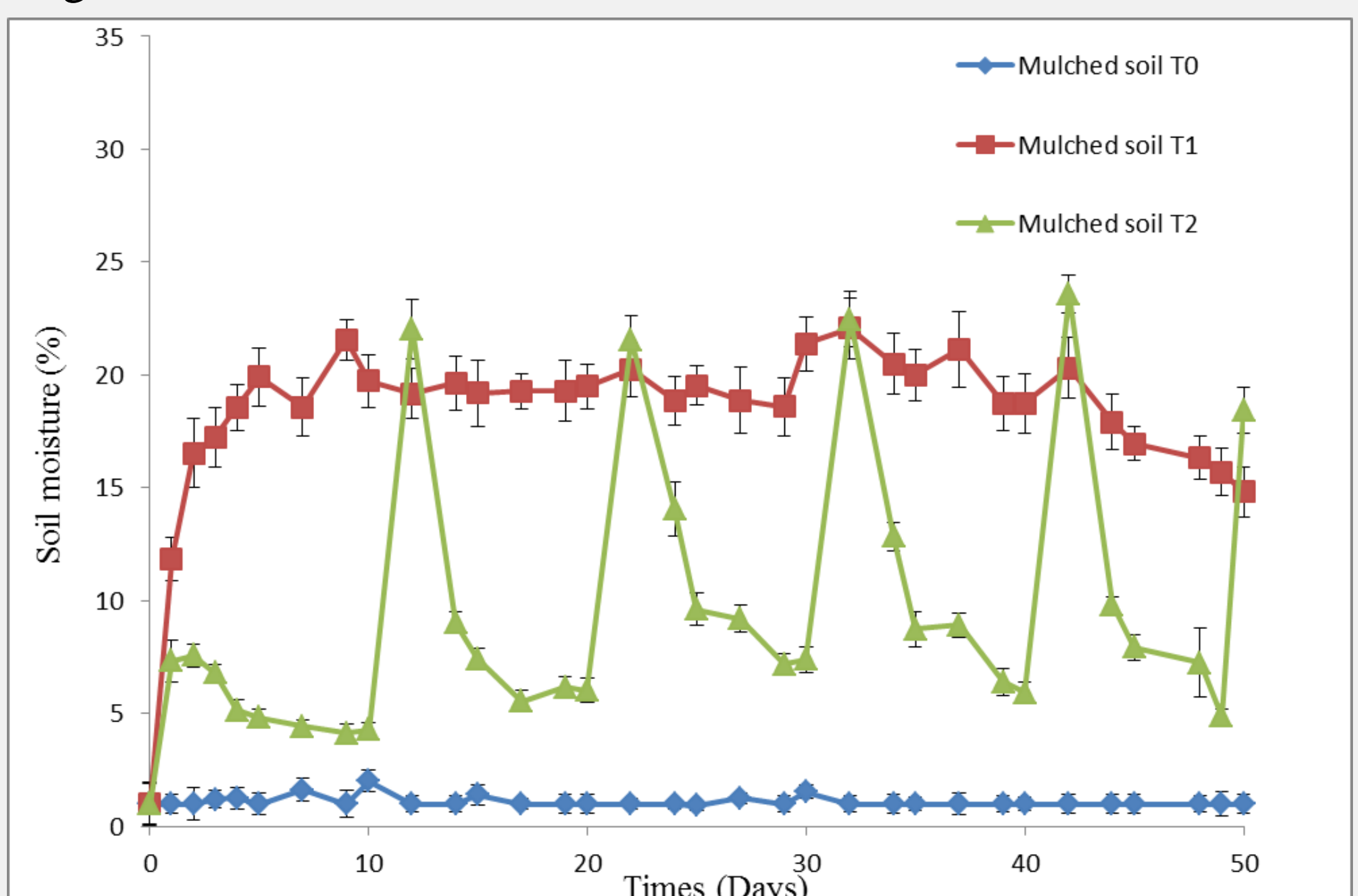
Mulched soil

Soil without Mulch



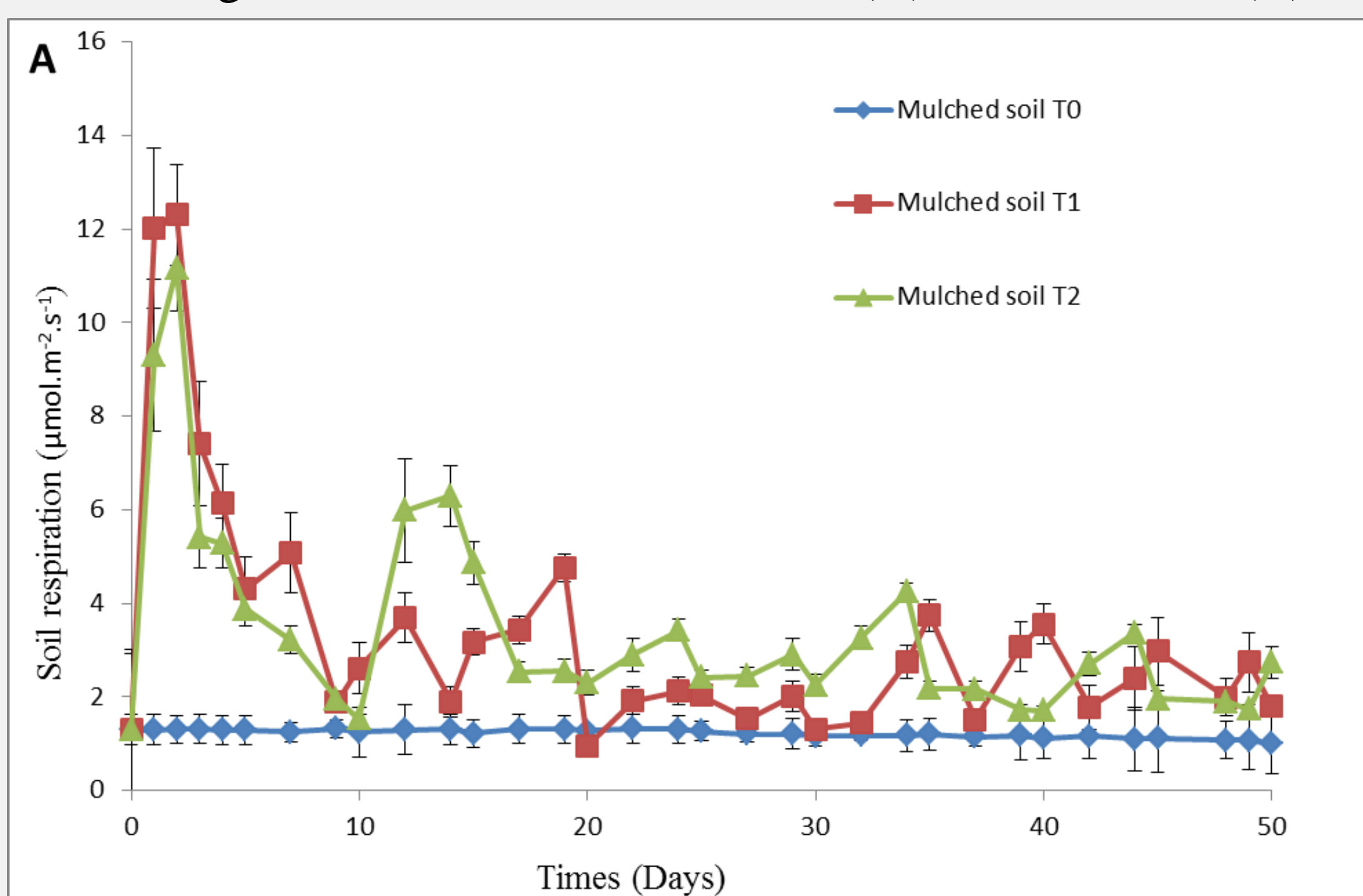
## Results and discussion

Figure 1: Variation of soil moisture on mulched soil



Different soil moisture treatments has caused some differentiated dry-wet cycles on mulched soil. At the first re-wetting, soil moisture is low on mulched soil.

Figure 2 : Carbon mineralization, (A) Mulched soil, (B) Soil without mulch



The wetting of dry soils caused immediately a flush of carbon mineralization on mulched soil and soil without mulch. The intensity of this flush is higher on mulched soil (21% increase). Without wetting, as expected, no flush is observed and carbon mineralization is low on both systems.

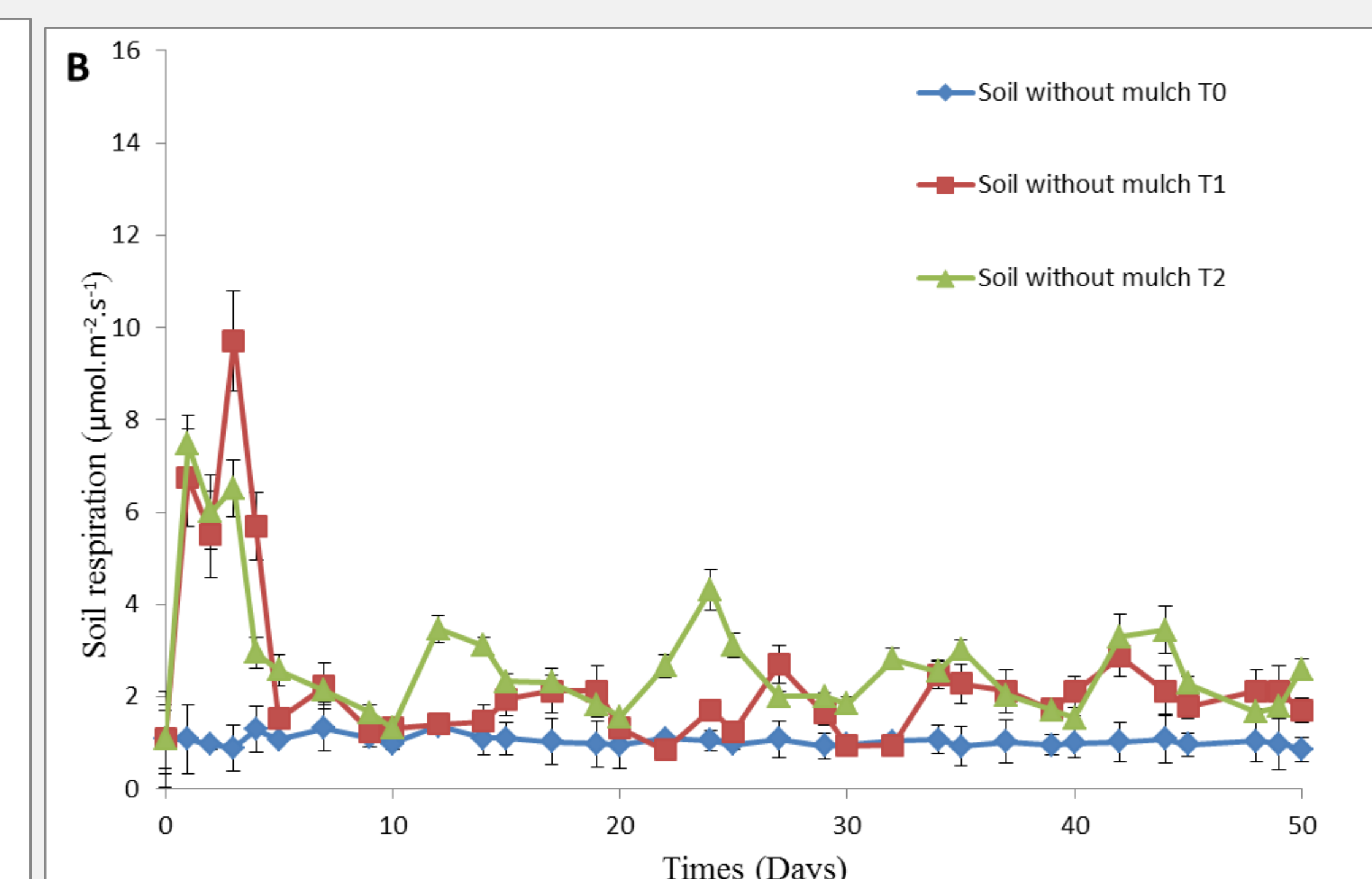
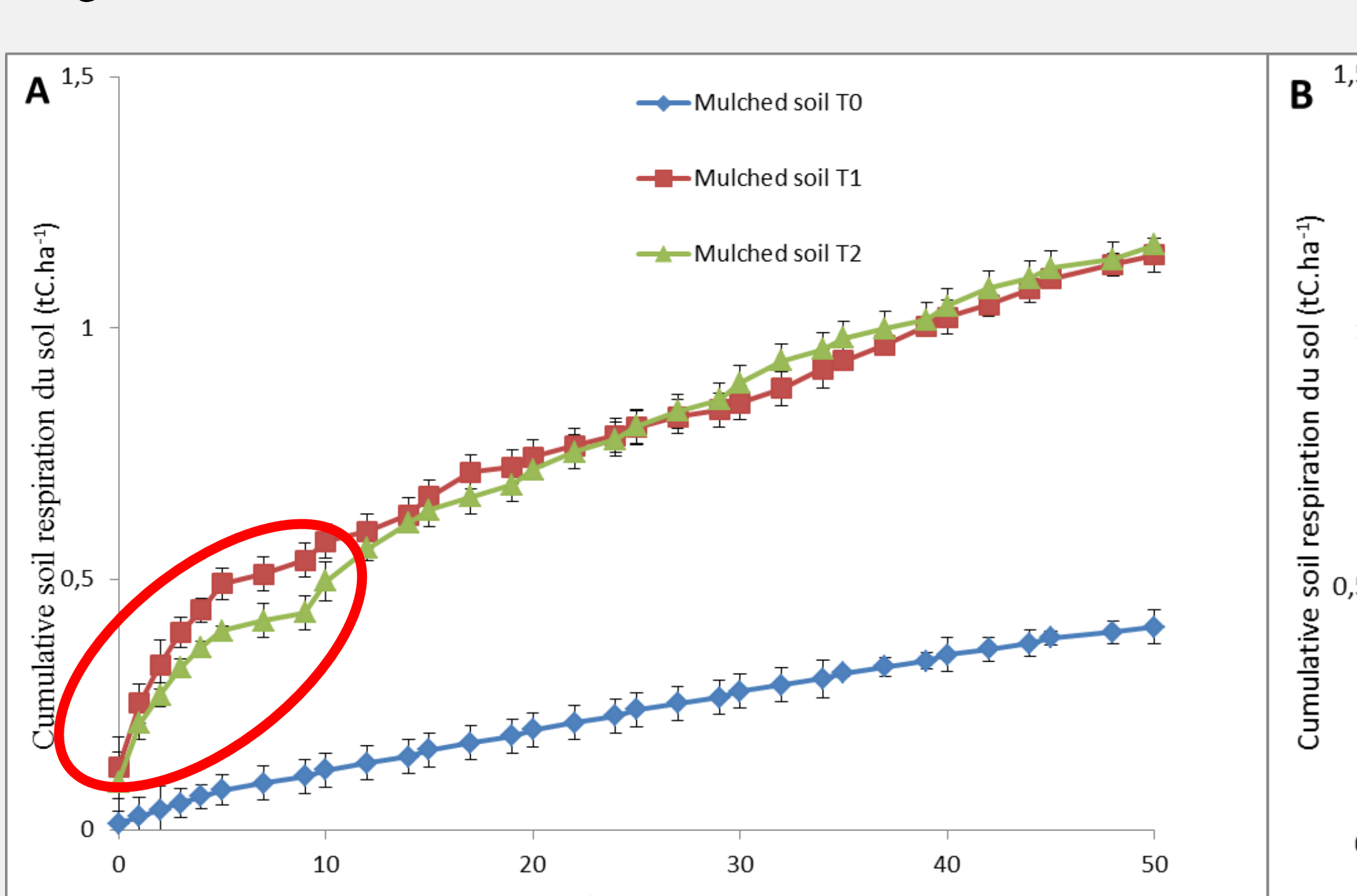


Figure 3 : Cumulative carbon mineralization (A) Mulched soil, (B) Soil without mulch



No difference between soils moisted each 10 days and soils kept moist continually, except the first period of drying following the re-wetting of mulched soil

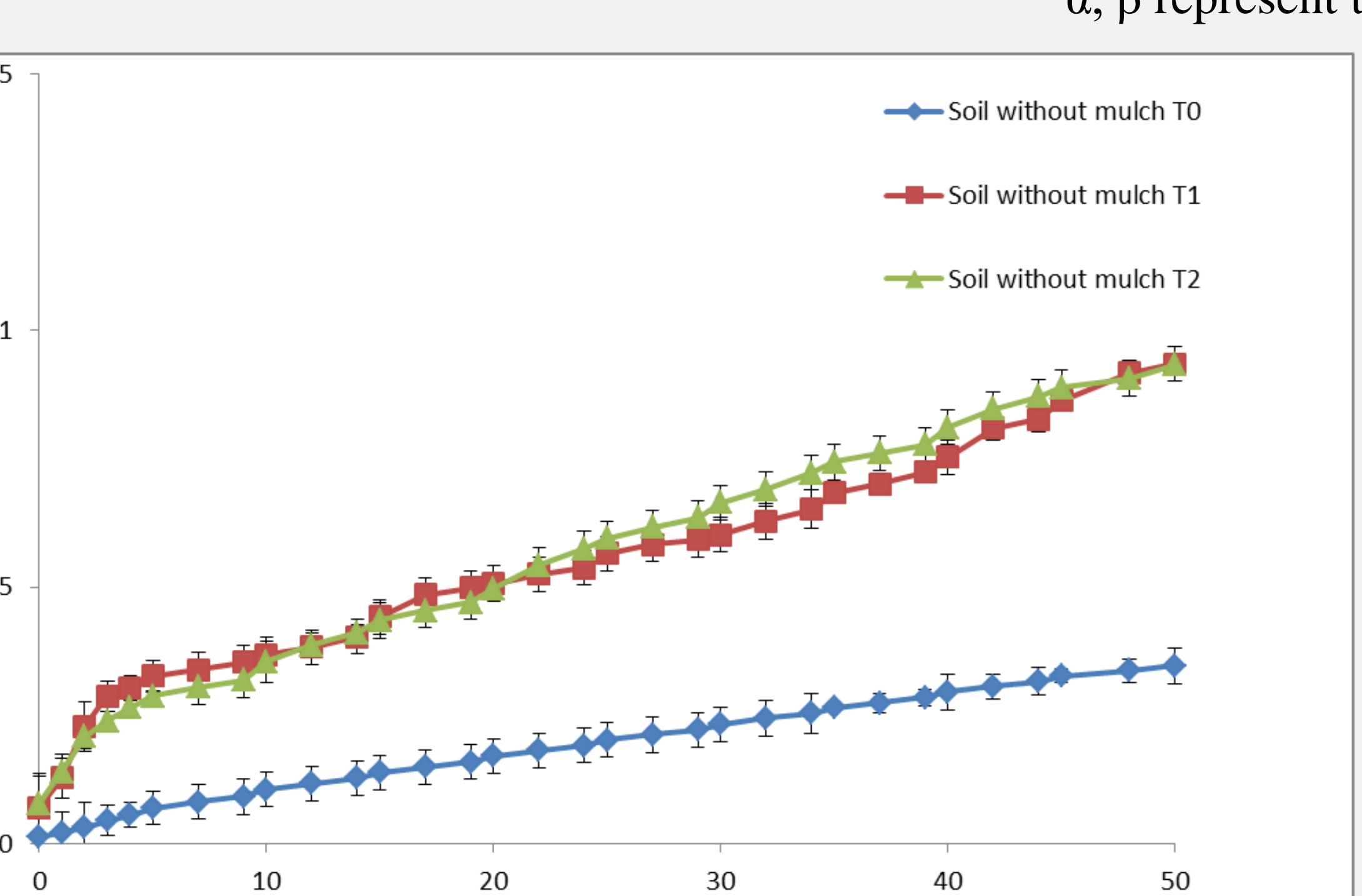
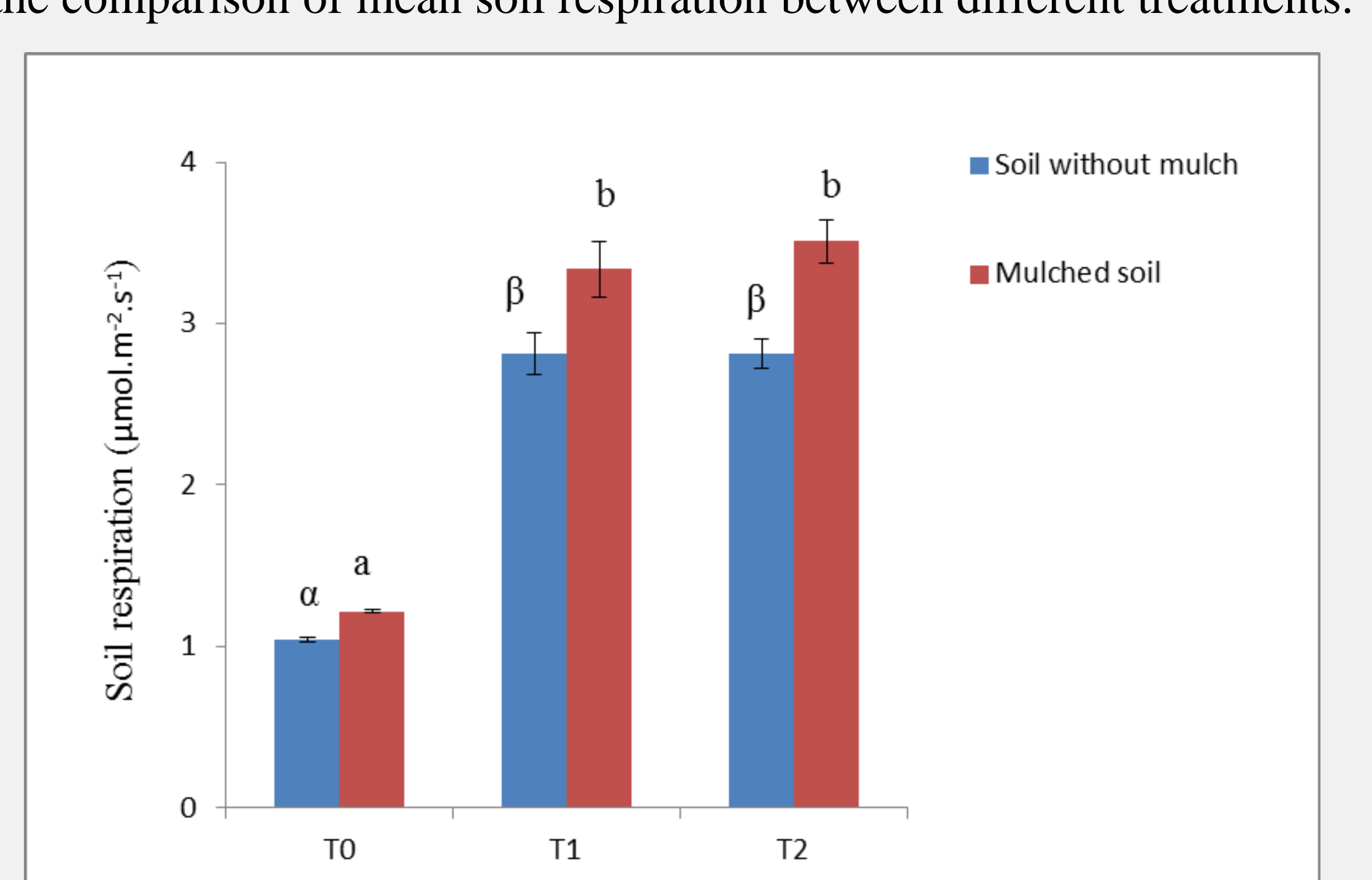


Figure 4 : Mean of soil respiration measurements on both systems for 50 days. a, b, α, β represent the comparison of mean soil respiration between different treatments.



Management method with the presence of mulch increased carbon mineralization, even in dry soils.

## Conclusion

The frequency of dry-wet cycles dit not affect soil carbon mineralization in sudano-sahelian context, except the first period of drying following the re-wetting of mulched soil.

Management method with the presence of mulch increased carbon mineralization, even in dry soils.