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En **transition** vers
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Conversion of savannah to cocoa agroforestry systems or other land uses: medium and long-term impacts on different soil organic C pools

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Afforestation of savannah with cocoa agroforestry systems (cAFS) is a common farmer practice in Cameroon previously described as a sustainable production option. Nevertheless, the effects of afforestation of savannah with cAFS on C turnover and content, and the factors controlling C accumulation and stabilization are unknown. Different systems settled on savannah were compared: cropland (\approx 5 years old), cocoa monoculture (\approx 10 years old) and cAFS (from 20 to 60 years old) shaded by different tree species (*Albizia adianthifolia*, *Canarium schweinfurthii*, *Dacryodes edulis*, *Milicia excelsa*, *Ceiba pentandra*). We used savannah and nearby forest patches as controls. Soils were orthic ferralsols with 9-15% of clay content. Soil analysis was performed on the 0-10 cm soil layer for: organic C content, C distribution in soil particle size fractions (0-20 μ m, 20-50 μ m, and 50-2000 μ m), and nutrient contents. Soil $\delta^{13}C$ was analysed for studying how the change from savannah grasses (C4 plants) to other vegetation (C3 plants) affected soil C turnover. The amount of annual litter input and its nutrient content were also analysed. Conversion of savannah to cAFS significantly increased soil C to the same level as soil C under nearby forests (Figure 1). Conversion of savannah to annual cropland or cocoa monoculture resulted in a non-significant decrease in soil C. After conversion of savannah to other land uses, more than 70% of soil C derived from C4 plants was lost within 10 years and then remained almost unchanged. Contrastingly, soil C derived from C3 plants increased significantly in cAFS. The C accumulation occurred both in the 50-2000 μ m and 0-20 μ m soil fractions, and was linked to cumulative higher litter inputs in cAFS than in other systems. Soil C under the different shade tree species was positively linked to soil pH, exch. Ca^{2+} and litter Ca content. Afforestation of savannah with cAFS appears as a valuable option for soil carbon sequestration.