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## Effects of land use change and grazing on soil carbon dynamics in the semi arid Chaco, Argentina

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In recent years deforestation of the Gran Chaco of Argentina has increased dramatically to make way for agricultural expansion. Extensive cattle ranching in particular is widespread across the country, and in the Chaco region of the north west much of the natural vegetation has been cleared for beef and crop production. The effects of forest clearance and grazing over time on soil carbon dynamics are unclear, with some evidence suggesting that soil carbon can to some extent recover under low intensity grazing practices, whilst others find that conversion to pasture followed by years of grazing consistently decreases soil carbon stocks. This study investigates the effects of land use change from forest to pasture over time on soil carbon stocks in the dry Chaco of north western Argentina, through the measurement of biological, physical and chemical variables within the soil. The hypothesis leading to this work is the key idea that livestock grazing can promote the accumulation of carbon in the soil over time through processes such as the stimulation of root growth of pasture grasses. In turn, increased carbon inputs can lead to net carbon sequestration, with great potential to mitigate the greenhouse gas emissions of the livestock sector. Using a chronosequence experimental design, destructive soil samples were taken from reference forest patches and pastures of 0-5, 10-15 and >20 years since deforestation and were tested for carbon, nitrogen, and phosphorus contents, root biomass, pH, electrical conductivity and texture. The research aims to investigate and explain the carbon dynamics of pastures in the years following deforestation, identify potential biotic and abiotic drivers of such dynamics, and predict potential future changes in soil carbon stocks.