

# Amelioration of a degraded Oxic Paleustalf by leguminous and natural fallows

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## Abstract

The restorative ability of herbaceous (*Psophocarpus palustris*, *Pueraria phaseoloides*) and woody (*Leucaena leucocephala*, *Senna siamea*, *Acacia leptocarpa*, *Acacia auriculiformis*) legume species and of natural regrowth was studied on an eroded and compacted Oxic Paleustalf in southwestern Nigeria. Compared to the control treatment that was continuously cropped for 15 years, four years of fallowing significantly improved test crop yields. However, fallowing with the above species did not substantially improve soil properties, particularly soil bulk density. A longer fallow period may be needed to amend soil physical conditions of this degraded Alfisol. Soil chemical properties were greatly improved following land clearing and plant biomass burning in 1993. However, the residual effect of burning on soil fertility was insignificant in the second cropping year. Among the fallow species, *P. palustris* and natural fallow showed the best residual effect on test crop performance. Despite the high biomass and nutrient yields of *S. siamea* and *A. auriculiformis*, test crop yields on these plots were low due to the border effects from the uncleared and fallowed subplots.

Keywords: Soil fertility; legumes; fallowing; Alfisols; Nigeria