Changes in Soil Organic Matter and Phosphorus Fractions under Planted Fallows and a Crop Rotation on a Colombian Volcanic-Ash Soil. (S03-barrios113337-Poster)

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Abstract:

Planted tree or shrub fallows can help increase the fertility of degraded tropical soils. We investigated the effects of planted fallows of Indigofera (IND), Calliandra (CAL), and Tithonia (TTH); a natural, unmanaged fallow (NAT); and a maize/bean rotation (ROT) on the dynamics and partitioning of soil organic matter (SOM) and phosphorus(P). One year after treatment, samples were collected from a fine-textured volcanic-ash soil (Oxic Dystropept) of a mid-altitude hillside in southwestern Colombia. The SOM in the sand-size fraction (150-2000 micron) was subdivided into light (LL), medium (LM) and heavy (LH) density fractions. Total soil P was also fractionated into inorganic (Pi) and organic (Po). Of the planted fallows, TTH most increased and NAT least increased plant available Pi and Po. The amounts of C, N and P in the LL and LM fractions of SOM followed the order, TTH>CAL>NAT>ROT>IND and CAL>TTH>IND>NAT>ROT, respectively. Total amounts of N, P, K, Ca and Mg in the soil were significantly ($P<0.05$) highest under TTH and lowest under NAT. Significant correlations indicated that the P content in the LL and LM fractions of SOM may help determine the amounts of NaHCO3-extractable Pi and

Po, which may therefore serve as sensitive indicators of 'readily available' and 'readily mineralizable' soil P pools, respectively, in the volcanic-ash soils of the Andes.

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