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## The Effect of Artificial Macropores on the Amount of Organic Matter in Soils and Plant Biomass.

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Artificial macropores constructed of fibrous material were installed in degraded red-yellowsoils to enhance vertical infiltration of organic matter and nutrients. This can enhance vertical infiltration without cultivation which causes small particle loss from the surface soils. Macropore and control (no macropore) plots were established and total carbon was measured at 10, 30, 50 cm depths every six months. Infiltrated soil water was sampled using a capillary force soil water sampler to measure total organic carbon and ion concentration. Results showed that soil total carbon increased in the macropore plot in spring and decreased in fall. The control plot showed few fluctuations. Total carbon concentrations in the soil water also increased in the macropore plot, which may be caused by introducing surface water into artificial macropores. In addition, nitrate nitrogen was higher in the summer in the macropore plot, representing a biological decomposition of organic matter and nutrients for plant growth. The plant biomass in the macropore plot was two times larger than that in control plot and the number of plant species also increased relative to the control plot. This vegetation represents a possible organic matter source for future soils. Finally, the carbon increment in low nutrient soils after macropore installation was calculated as  $0.0036 \text{ g-C}\cdot\text{g-soil}^{-1}\cdot\text{yr}^{-1}$  ( $20.4 \text{ t-C}\cdot\text{ha}^{-1}\cdot\text{yr}^{-1}$ ), which was very successful. This study demonstrates that the relatively simple technique of installing artificial fibrous macropores can increase organic matter and recover vegetation in poorly drained soils.