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## Estimation of the amount of organic carbon sequestered by coffee plantations in the central area of the state of Veracruz (Mexico)

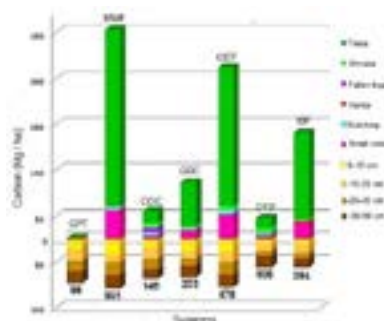
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Coffee agroforestry systems (CAS) have a high potential for carbon sequestration (C) due to the large diversity of woody species used as shade. The objective of this study was to evaluate the potential of carbon capture in aerial biomass, mulch, and soil organic matter at different depths in the CAS at the coffee region of Huatusco, Veracruz, Mexico. The agroforestry systems studied were a Mesophilic Mountain Forest (MMF), that served as a reference, and three shade coffee plantations (specialized systems: OEF, CCF and IBF) and two in full sun (COC, OEF) which were compared to each other. Also, as a contrast of a not agroforestry system, a conventional pasture (CPT). Harvesting of herbaceous and mulch vegetal samples was done in plots of 4x25 m<sup>2</sup> (UM); shrub and tree biomass were measured too. The soil was sampled at four depths (0-10, 10-20, 20-30 and 30-60 cm). Tree biomass was estimated by allometric equations. The system that showed the highest C content in aerial biomass was MMF (457 Mg C ha<sup>-1</sup>), followed by OEF (374 Mg C ha<sup>-1</sup>), IBF (232 Mg C ha<sup>-1</sup>), GBC C ha<sup>-1</sup>), COC (61.1 Mg C ha<sup>-1</sup>), CCF (46.0 Mg C ha<sup>-1</sup>) and CPT (3.1 Mg C ha<sup>-1</sup>). Regarding the total organic C captured, the poorly intervened forest ecosystem (MMF) reached the maximum value (565 Mg C ha<sup>-1</sup>), of the coffee systems the OEF obtained the highest value (478 Mg C ha<sup>-1</sup>) and the CCF the lowest (108 Mg C ha<sup>-1</sup>). CPT only stored 99.0 Mg C ha<sup>-1</sup>. It is concluded that the coffee systems quantify an average of 246 Mg C ha<sup>-1</sup> of C captured, depending largely on the management, there was a significant separation between those in shade from the ones in full sun.



### Biography

Eduardo Valdés Velarde is Professor of Ecology at the Department of Plant Science of Chapingo Autonomous University in Mexico since 2007. He has been a teacher of high school, undergraduate and graduate students since 1997, lecturing more than 25 subjects. He has been the director and thesis adviser for more than 25 undergraduate and graduate students. He has given numerous lectures and courses-workshops in several universities in Mexico and Ecuador. He has been responsible for several research, cultural diffusion, service and technology transfer projects. He is currently the Director of the Agroforestry Center for Sustainable Development of the Chapingo Autonomous University. His main lines of research focus on the study of ecosystem services in mangroves, coffee plantations and shrublands.

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